

UTAH OIL AND GAS CONSERVATION COMMISSION

REMARKS: WELL LOG ELECTRIC LOGS FILE ☒ WATER SANDS LOCATION INSPECTED SUB. REPORT/abd.

DATE FILED 3-26-92

LAND: FEE & PATENTED

STATE LEASE NO.

PUBLIC LEASE NO. U-48776

INDIAN

DRILLING APPROVED: 4-13-92

SPUDDED IN:

COMPLETED: 7-9-92 LA PUT TO PRODUCING:

INITIAL PRODUCTION:

GRAVITY A.P.I.

GOR:

PRODUCING ZONES:

TOTAL DEPTH:

WELL ELEVATION:

DATE ABANDONED: LA'D Per Request of Oper's Agent "Dolar Oil Properties) eff 7-9-92

FIELD: WILDCAT

UNIT: TIMBER CANYON

COUNTY: WASATCH

WELL NO. TIMBER CANYON 17-1

API NO. 43-051-30017

LOCATION 1005' FSL FT. FROM (N) (S) LINE,

109' FEL

FT. FROM (E) (W) LINE. SE SE

1/4 - 1/4 SEC.

17

TWP.	RGE.	SEC.	OPERATOR	TWP.	RGE.	SEC.	OPERATOR
------	------	------	----------	------	------	------	----------

5S

9W

17

GLOBAL NATURAL RES.



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Vernal District Office
170 South 500 East
Vernal, Utah 84078

Phone (801) 789-1362

FAX (801) 789-3634



IN REPLY REFER TO:

3160
(UT08438)

MAR 24 1992

CERTIFIED MAIL
Return Receipt Requested
No. P 755 884 247

Global Natural Resources Corp. of Nev.
5300 Memorial Drive, Suite 800
Houston, TX 77007

Re: Well No. 17-1
SESE, Sec. 17, T5S, R9W
Lease No. U-48776
Wasatch County, Utah

Gentlemen:

Enclosed is an approved copy of the Application for Permit to Drill (APD) for the above referenced well.

Service of this letter shall be deemed to occur when received or seven (7) business days after the date this letter is mailed, whichever is earlier.

A section governing appeals of decisions and approvals relating to proposed operations was added to 43 CFR Part 3160 by an interim final rule. The effective dates are March 13, 1992 through December 31, 1992. Now, under 43 CFR 3165.4(c), the decision to approve an APD is in full force and effect when an appeal is filed, unless the appellant shows sufficient justification to the Interior Board of Land Appeals (IBLA) that a stay is necessary.

If you have any questions concerning APD processing, please contact Sally Gardiner of this office at (801) 789-1362.

Sincerely,

Howard B. Cleavinger II
Assistant District Manager for
Mineral Resources

Enclosure

cc: Mark S. Dolar
U.S. Forest Service

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPPLICATE*
(Other instructions on
reverse side)

Form approved.
Budget Bureau No. 1004-0136
Expires August 31, 1985

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK

DRILL ☒

DEEPEN ☐

PLUG BACK ☐

b. TYPE OF WELL

OIL
WELL ☒

GAS
WELL ☒

OTHER

SINGLE
ZONE ☐

MULTIPLE
ZONE ☐

2. NAME OF OPERATOR

Global Natural Resources Corporation of Nevada

3. ADDRESS OF OPERATOR

5300 Memorial Drive, Suite 800, Houston, Texas 77007

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)*

At surface

1005 feet from South line, 109 feet from East line.
SESE

At proposed prod. zone
Same

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*

28½ miles southwest of Duchesne, Utah

15. DISTANCE FROM PROPOSED*

LOCATION TO NEAREST
PROPERTY OR LEASE LINE, FT.
(Also to nearest drlg. unit line, if any) 109 feet

16. NO. OF ACRES IN LEASE

9,159.80

17. NO. OF ACRES ASSIGNED
TO THIS WELL

160.00

18. DISTANCE FROM PROPOSED LOCATION*
TO NEAREST WELL, DRILLING, COMPLETED,
OR APPLIED FOR, ON THIS LEASE, FT.

No other
locations

19. PROPOSED DEPTH

6,500 feet

20. ROTARY OR CABLE TOOLS

Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)

7,689 feet KB

22. APPROX. DATE WORK WILL START*

July 1, 1992

23.

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
8 5/8"	7 7/8"	15½ lb	350 feet	30 sacks of Class G cement
7 7/8"	5 1/2"	15½ lb	6500 feet	Amount determined after review of caliper log, Class G cement.

RECEIVED
MAR 26 1992
DIVISION OF
OIL GAS & MINING

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout prevention program, if any.

24.

SIGNED

MARK S. DOLAR, CPL

TITLE Contract Landman

DATE 9/16/91

(This space for Federal or State office use)

PERMIT NO.

13-05130017

APPROVAL DATE

ASSISTANT DISTRICT
MANAGER MINERALS

APPROVED BY

TITLE

DATE MAR 24 1992

CONDITIONS OF APPROVAL, IF ANY:

NOTICE OF APPROVAL

*See Instructions On Reverse Side

CONDITIONS OF APPROVAL ATTACHED
TO OPERATOR'S COPY

CONDITIONS OF APPROVAL
APPLICATION FOR PERMIT TO DRILL

Company/Operator: Global Natural Resources Corp. of Nev.

Well Name & Number: 17-1

Lease Number: U-48776

Location: SESE Sec. 17 T. 5S R. 9W

Surface Ownership: Federal Lands administered by U.S. Forest Service

NOTIFICATION REQUIREMENTS

- | | | |
|---------------------------------|---|--|
| Location Construction | - | at least forty-eight (48) hours prior to construction of location and access roads notify U.S. Forest Service at (801) 738-2482. |
| Location Completion | - | prior to moving on the drilling rig notify U.S. Forest Service. |
| Spud Notice | - | at least twenty-four (24) hours prior to spudding the well notify BLM. |
| Casing String and Cementing | - | at least twenty-four (24) hours prior to running casing and cementing all casing strings notify BLM. |
| BOP and Related Equipment Tests | - | at least twenty-four (24) hours prior to initiating pressure tests notify BLM. |
| First Production Notice | - | within five (5) business days after new well begins, or production resumes after well has been off production for more than ninety (90) days notify BLM. |

For more specific details on notification requirements, please check the Conditions of Approval for Notice to Drill and Surface Use Program.

CONDITIONS OF APPROVAL FOR NOTICE TO DRILL

Company Global Natural Resources Corp. Well No. Timber Canyon 17-1

Location SESE, Section 17, T5S, R9W Lease No. U - 48776

Approval of this application does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Be aware fire restrictions may be in effect when location is being constructed and/or when well is being drilled. Contact the appropriate Surface Management Agency for information.

A. DRILLING PROGRAM

1. Estimated Depth at Which Oil, Gas, Water, or Other Mineral Bearing Zones are Expected to be Encountered

Report ALL water shows and water-bearing sands to Tim Ingwell of this office. Copies of State of Utah form OGC-8-X are acceptable. If noticeable water flows are detected, submit samples to this office along with any water analyses conducted.

All usable water and prospectively valuable minerals (as described by BLM at onsite) encountered during drilling, will be recorded by depth and adequately protected. All oil and gas shows will be tested to determine commercial potential.

2. Pressure Control Equipment

The BOP and related equipment shall meet the minimum requirements of onshore Oil and Gas Order No. 2 for equipment and testing requirements, procedures, etc., and individual components shall be operable as designed. Chart recorders shall be used for all pressure tests.

Test charts, with individual test results identified, shall be maintained on location while drilling and shall be made available to a BLM representative upon request.

The Vernal District Office shall be notified, at least 24 hours prior to initiating the pressure tests, in order to have a BLM representative on location during pressure testing.

3. Casing Program and Auxiliary Equipment

Surface casing shall have centralizers on the bottom three joints, with a minimum of one centralizer per joint.

The surface casing shall be cemented to surface with a cement that will meet the minimum physical requirements specified API Specification 10 and conform to the minimum requirements of Onshore Oil and Gas Order No. 2.

As a minimum, the usable water and oil shale resources shall be isolated and/or protected by having a cement top for the production casing at least 200 ft. above the top of the Mahogany oil shale, identified at \pm 1,450 ft.

The Vernal District Office shall be notified at least 24 hours prior to the running and cementing of all casing strings, in order to have a BLM representative on location while running and cementing all casing strings.

4. Mud Program and Circulating Medium

Hazardous substances specifically listed by the EPA as a hazardous waste or demonstrating a characteristic of a hazardous waste will not be used in drilling, testing, or completion operations.

No chromate additives will be used in the mud system on Federal and Indian lands without prior BLM approval to ensure adequate protection of fresh water aquifers.

5. Coring, Logging and Testing Program

Daily drilling and completion progress reports shall be submitted to this office on a weekly basis.

All Drill Stem tests (DST) shall be accomplished during daylight hours, unless specific approval to start during other hours is obtained from the AO. However, DSTs may be allowed to continue at night if the test was initiated during daylight hours and the rate of flow is stabilized and if adequate lighting is available (i.e., lighting which is adequate for visibility and vaporproof for safe operations). Packers can be released, but tripping should not begin before daylight unless prior approval is obtained from the AO.

A cement bond log (CBL) shall be utilized to determine the top of cement (TOC) and bond quality for the production casing.

6. Notifications of Operations

No location will be constructed or moved, no well will be plugged, and no drilling or workover equipment will be removed from a well to be placed in a suspended status without prior approval of the AO. If operations are to be suspended, prior approval of the AO will be obtained and notification given before resumption of operations.

Operator shall report production data to MMS pursuant to 30 CFR 216.5 using form MMS/3160.

The date on which production is commenced or resumed will be construed for oil wells as the date on which liquid hydrocarbons are first sold or shipped from a temporary storage facility, such as a test tank, and for which a run ticket is required to be generated or, the date on which liquid hydrocarbons are first produced into a permanent storage facility, whichever first occurs; and, for gas wells as the date on which associated liquid hydrocarbons are first sold or shipped from a temporary storage facility, such as a test tank, and for which a run ticket is required to be generated or, the date on which gas is first measured through permanent metering facilities, whichever first occurs.

Gas produced from this well may not be vented or flared beyond an initial authorized test period of 30 days or 50 MMCF following its completion, whichever occurs first, without the prior written approval of the Authorized Officer. Should gas be vented or flared without approval beyond the authorized test period, the operator may be directed to shut-in the well until the gas can be captured or approval to continue venting or flaring as uneconomic is granted and the operator shall be required to compensate the

lessor for that portion of the gas vented or flared without approval which is determined to have been avoidably lost.

7. Other Information

Gas meter runs for each well will be located within 500 feet of the wellhead. The gas flowline will be buried or anchored down from the wellhead to the meter and 500 feet downstream of the meter run or any production facilities. Meter runs will be housed and/or fenced.

The use of materials under BLM jurisdiction will conform to 43 CFR 3610.2-3.

Section 102(b)(3) of the Federal Oil and Gas Royalty Management Act of 1982, as implemented by the applicable provisions of the operating regulations at Title 43 CFR 3162.4-1(c), requires that "not later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in the case of a well which has been off production for more than 90 days, the operator shall notify the authorized officer by letter or sundry notice, Form 3160-5, or orally to be followed by a letter or sundry notice, of the date on which such production has begun or resumed."

If you fail to comply with this requirement in the manner and time allowed, you shall be liable for a civil penalty of up to \$10,000 per violation for each day such violation continues, not to exceed a maximum of 20 days. See Section 109(c)(3) of the Federal Oil and Gas Royalty Management Act of 1982 and the implementing regulations at Title 43 CFR 3162.4-1(b)(5)(ii).

APD approval is valid for a period of one (1) year from the signature date. An extension period may be granted, if requested, prior to the expiration of the original approval period.

In the event after-hours approvals are necessary, please contact one of the following individuals:

Gerald E. Kenczka (801) 781-1190
Petroleum Engineer

Ed Forsman (801) 789-7077
Petroleum Engineer

BLM FAX Machine (801) 789-3634

Contact for Surface Approval

Ashley National Forest (801) 738-2482
Duchesne Ranger District
Joseph R. Bistrski

EPA'S LIST OF NONEXEMPT EXPLORATION AND PRODUCTION WASTES

While the following wastes are nonexempt, they are not necessarily hazardous.

Unused fracturing fluids or acids

Gas plant cooling tower cleaning wastes

Painting wastes

Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids

Vacuum truck and drum rinsate from trucks and drums, transporting or containing nonexempt waste

Refinery wastes

Liquid and solid wastes generated by crude oil and tank bottom reclaimers

Used equipment lubrication oils

Waste compressor oil, filters, and blowdown

Used hydraulic fluids

Waste solvents

Waste in transportation pipeline-related pits

Caustic or acid cleaners

Boiler cleaning wastes

Boiler refractory bricks

Incinerator ash

Laboratory wastes

Sanitary wastes

Pesticide wastes

Radioactive tracer wastes

Drums, insulation and miscellaneous solids.

B. SURFACE USE PROGRAM

1. Planned Access Roads

The access road will have a 14 foot running surface maximum.

Access road construction and maintenance will conform to U.S. Forest Service standards outlined in Attachment 1.

2. Location of Existing and/or Proposed Facilities

Tank batteries will be placed in the southeast corner of the well pad. Any change for modification from this plan will be filed for approval in the form of a written sundry notice.

All above-ground facilities will be painted earthtone color (Munsell Soil Color 5Y 6/3) Sand Beige within six months of the well completion.

3. Location and Type of Water Supply

Global Natural Resources Corp. will lay a surface hose from Timber Canyon Creek in the NW/4NW/4 of Section 21, T5S, R9W to the surface location. The water will be pumped to the location for usage. Approximately 10,000 barrels of water will be needed, and it is the intention of the Operator to negotiate, and pay in advance, a depletion fee to the Utah State Division of Fish & Game prior to obtaining usage. The operator will also obtain a permit from the Utah State Water Engineer for approval of usage prior to activities beginning.

Global Natural Resources Corp. shall contact U.S. Fish and Wildlife Service to determine the process for paying the depletion fee and the fee shall be paid in full prior to removing any water from Timber Canyon Creek.

If water for drilling is pumped from the creek, a small mesh screen will be placed over the intake of the pipe and rocks piled around the intake. The operator must check with the State concerning water rights and approval to use the creek as a water source.

4. Source of Construction Materials

Excess dirt from the pad site will be used as infill. All other sources for construction of surface materials, including gravel, will be purchased from private sources and will be hauled into the location. Bids will be taken prior to construction, and the BLM will be notified, by way of sundry notice, of exact materials used and name of contractors prior to construction.

5. Methods for Handling Waste Disposal

A reserve pit liner will be required. The liner will have a burst strength of not less than 140 psi. If the reserve pit is excavated through sand, fractured rock or gravel, the liner will have a burst strength of not less than 200 psi. The drill site will be constructed so all surface runoff from the site drains into the reserve pit. No trash will be disposed of in the reserve pit.

6. Well Site Layout

Rock or structures will be placed in the re-routed drainage to reduce water velocity and potential erosion.

The channel capacity of the rerouted drainage should duplicate or exceed the existing channel. Some meanders should be added along with rock in the bottom of the new channel. The objective is to reduce velocities of the water thereby reducing sediment load to Timber Canyon Creek.

A drainage ditch will be cut between the well pad and existing road to catch runoff from the side of the well pad.

7. Surface Ownership:

Federal, managed by U.S. Forest Service. Mineral is Federal, managed by BLM.

8. Additional Surface Stipulations

Construction and drilling activities can only occur during the period from June to December.

Section 101 - Abbreviations

101.01

Organizations &
Standards

Whenever in these specifications, or in other contract documents, the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as follows. Reference to a specific standard or specification shall mean the latest edition or amendment in effect on date of invitation to bid.

101

.01

AASHTO--American Association of State Highway and Transportation Officials

ACI--American Concrete Institute

AISC--American Institute of Steel Construction

AISI--American Iron and Steel Institute

AITC--American Institute of Timber Construction

ANSI--American National Standards Institute

APA--American Plywood Association

API--American Petroleum Institute

ASME--American Society of Mechanical Engineers

ASTM--American Society for Testing and Material

ATCC--American Type Culture Collection

AWPA--American Wood Preservers Association

AWPB--American Wood Preservers Bureau

AWS--American Welding Society

AWWA--American Water Works Association

CFR--Code of Federal Regulations

CRSI--Concrete Reinforcing Steel Institute

CS--Commercial Standard issued by U.S. Department of Commerce

DEMA--Diesel Engine Manufacturers Association

FAR--Federal Acquisition Regulation

FED SPEC. or FS--Federal Specifications

FSS--Federal Specifications and Standards

GSA--General Services Administration

MIL--Military Specifications

MSHA--Mine Safety and Health Administration

MUTCD--Manual on Uniform Traffic Control Devices

NBFU--National Board of Fire Underwriters

NBS--National Bureau of Standards

NEMA--National Electrical Manufacturers Association

NESC--National Electrical Safety Code

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.01

NFPA--(Fire)--National Fire Protection Association
NFPA--(Forest)--National Forest Products Association
NWMA--National Woodwork Manufacturers Association
OSHA--Occupational Safety and Health Administration
PCA--Portland Cement Association
PCI--Prestressed Concrete Institute
PS--Product Standard issued by the U.S. Department of Commerce
PTI--Post-Tensioning Institute
RIS--Redwood Inspection Service
SAE--Society of Automotive Engineers
SF--Standard Form
SSPC--Steel Structures Painting Council
UL--Underwriter's Laboratories, Inc.
USASI--United States of America Standards Institute
WCLIB--West Coast Lumber Inspection Bureau
WWPA--Western Wood Products Association

101.02
Pay Items
& Pay Units

ABBREVIATIONS

Aluminum	AL.
Asphalt	ASP.
Barbed Wire	B.W.
Bituminous Coated Corrugated Steel Pipe	B.C.C.S.P. OR B.C.C.S. PIPE
Cement	CEMT.
Cement Treated	CEMT.-T.
Cement Treated Base	CTB
Clearing & Grubbing	CLEAR & GRUB
Compaction	CMPCT.
Concrete	CONC.
Corrugated Metal Pipe	CMP
Corrugated Steel Pipe	C.S.P.
Corrugated Steel Pipe Arch	C.S.P. ARCH
Cubic Yard	C.Y.
Cubic Yard Mile	C.Y.MI.
Diameter	DIA.
Each	EA.
Emulsified	EMLSFD.
Erosion and Pollution Control	E&P CONTROL
Fabricated	FABR.
Foundation	FOUND.
Furnished	FURN.
Gallon	GAL.
Grade	GR.
Height	HT.
High Strength	H. STRENGTH
Horizontal	HOR.
Hour	HR.
Linear Foot	L.F.
Liquid	LIQ.
Loading	LD.
Lump Sum	L.S.
Material	MAT'L
Maximum	MAX.
Method	M.

Mile	MI.
Minimum	MIN.
One Thousand Feet Board Measure	MFEM
One Thousand Gallons	M.GALS.
One Thousand Gallons Mile	M.GALS.MI.
One Thousand Square Feet	M.S.F.
Polyvinylchloride	PVC
Pounds	LBS.
Reflectorized	REFLECT.
Section	SEC.
Square Foot	S.F.
Square Yard	S.Y.
Station	STA.
Station Yard	STA. YD.
Strand	S.
Structural	STRUCT.
Structural Steel	S. STEEL
Stump	STMP
Target Value	TV
Thickness	TH.
Ton Mile	T.M.
Tops and Limbs	T&L
Utilization of Timber	UOT
Vertical	VERT.
White	WH.
Width	W.
With	W/
Without	W/O
Woven wire	W.W.
Yellow	YE.

101
.02

Section 102 - Definitions

Wherever in these specifications, or in other contract documents, the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as follows:

Adjustment in Contract Price. "Adjustment in contract price" shall mean "equitable adjustment" as used in the Federal Acquisition Regulations, or "Construction Cost Adjustment" as used in the Timber Sale Contract as applicable.

Arch Pipe. A culvert section, usually formed of bolted structural plates, that is an arc of a circle (usually one-half or less); that is, a bottomless culvert.

Base Course. The layer or layers of specified or selected material of designed thickness placed on a subbase or subgrade to support a surface course. (See figure 102-1.)

Bearings. The portion of a beam, girder, or truss that transmits the bridge superstructure load to the substructure.

Berm. Curb or dike constructed to control roadway runoff water. (See figure 102-1.)

Bridge. A structure, including supports, erected over a depression or an obstruction, such as water, road, trail, or railway, and having a floor for carrying traffic or other moving loads.

Bridge Length. The overall length measured along the centerline of road to the back of abutment backwalls, if present; otherwise, end to end of the bridge floor, but in no case less than the total clear opening of the structure.

Bridge Traveled Way Width. The clear width measured at right angles to the longitudinal centerline of the bridge between the bottom of curbs or, if curbs are not used, between the inner faces of parapet or railing.

Change. "Change" means "Change Order" as used in the Federal Acquisition Regulations, or "Design Change" as used in the Timber Sale Contract.

Clearing Limits. The limits of clearing as designated on the ground or on the drawings. (See figure 102-1.)

Conduit. A natural or artificial channel for carrying fluids, as water pipes, canals, and aqueducts.

Construction Slash. All vegetative material not meeting utilization standards, such as tops and limbs, timber, brush, and grubbed stumps associated with construction or reconstruction of a facility.

Contracting Officer (CO). The person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings.

Contractor. The individual, partnership, joint venture, or corporation undertaking the execution of the work under the terms of the contract and acting directly or through their agent, employees, or subcontractors. As used in specifications and drawings for specified roads (Timber Sale Contracts), "contractor" is "purchaser."

Controlled Felling. Directing the placement of trees in felling by wedges, jacks, cable tension, or distribution of holding wood or any combinations of these which will ensure that trees are dropped into previously cleared areas, or clear of any objects that are to remain.

Culvert. A conduit or passageway under a road, trail, or other obstruction. A culvert differs from a bridge in that it is usually constructed entirely below the elevation of the traveled way.

Cushion Material. Native or imported material generally placed over rocky sections of unsurfaced roads to provide a usable and maintainable traveled way.

Defect. A failure to meet a requirement with respect to a single quality characteristic.

Drawings. The documents, including plan and profile sheets, cross sections, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials showing details for construction of a facility.

Embankment. A structure of soil, aggregate, or rock material placed on the prepared ground surface and constructed to subgrade.

Engineer. The Contracting Officer's Representative (COR) or Engineering Representative (ER) responsible for onsite administration of the contract.

Equipment. All machinery and equipment, together with the necessary supplies for upkeep and maintenance, as well as tools and apparatus necessary for the proper construction and acceptable completion of the work.

Excess Excavation. Material from the roadway in excess of that needed for construction of designed roadways.

Forest Service. The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Gauge. The term "gauge" when used in connection with the measurement of plates will mean the U.S. Standard Gauge, except when reference is made to the measurement of metal sheets used in the manufacture of corrugated metal, pipe, metal plate culverts and arches, and metal cribbing, then the term means the "gauge" or "thickness" specified in AASHTO M 36, M 167, M 196, and M 219, as applicable. When the term "gauge" refers to the measurement of wire, it will mean the wire gauge specified in AASHTO M 32.

Government Land. National Forest System lands, and other lands controlled or administered by the Forest Service or by other Federal agencies.

Inspector. The Government-authorized representative designated in writing by the CO, COR, or ER responsible for detailed inspection.

Job-Mix Formula. The percentage of each material in a mixture intended for a particular use.

Laboratory. A testing laboratory of the Government or any other testing laboratory approved by the Contracting Officer.

Materials. Any substance specified for use in the construction of the project and its appurtenances.

Maximum Density. The highest density that can be obtained under stated conditions.

Measurement. Determining and expressing the quantities of work or materials.

Multi-Beam Girder. A precast, prestressed concrete member where the concrete deck is precast as an integral part of the member.

Neat Line. A line defining the proposed or specified limits of an excavation or structure.

Nominal Dimensions or Weights. The numerical values shown on the drawings or in the specifications as measurements of material to be used in the construction.

Nominal Maximum Particle Size. The largest sieve size listed in the applicable specification upon which any material is permitted to be retained.

Overbreak. Material beyond the neat line of an excavation that is removed in the process of excavation, usually by blasting.

Pavement Structure. Subbase, base, or surface course, or combination thereof, placed on a subgrade to support the traffic load and distribute it to the roadbed.

Pioneer Road. Temporary construction access built along the route of the project.

Pipe. A culvert that is circular (round) in cross-section.

Pipe-Arch. A pipe that has been factory-deformed from a circular shape such that the width (or span) is larger than the vertical dimension (or rise).

Profile Grade. The trace of a vertical plane, as shown on the drawings, intersecting the top surface at the centerline of the proposed facility construction.

Purchaser. The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through his, their, or its agents, employees, or subcontractors.

Random Sampling. Sampling at times or locations determined in advance by the use of a table of random numbers.

Reasonably Close Conformity. Unless working tolerances are specified, all work performed and materials furnished shall be in reasonably close conformity with lines, grades, cross sections, dimensions, and material requirements shown on the drawings, indicated in the specifications, or designated on the ground. "Reasonably close conformity" is compliance with reasonable and customary manufacturing and construction tolerances.

Right-of-Way. A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands) or (2) land, appurtenances thereto, or interest therein, usually in a strip, acquired for public or private passageway. (See figure 102-1.)

Road Template. The shape and cross-sectional dimensions of the roadway to be constructed as defined by the construction staking notes and the characteristics of the typical sections.

Roadbed. The graded portion of a road between the intersection of subgrade and side slopes excluding that portion of the ditch below subgrade. (See figure 102-1.)

Roadside. A general term denoting the area adjoining the outer edge of the roadway. (See figure 102-1.)

Roadway. The portion of the road within the limits of excavation and embankment, including slope rounding. (See figure 102-1.)

Schedule of Items. A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, methods of measurement, unit price, and amount.

Second Samples. A sample taken when the initial sample indicates that the material is defective.

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Shoulder. The portion of the roadway contiguous to the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of pavement structure. (See figure 102-1.)

Sidewalk. The portion of the roadway constructed primarily for pedestrian use.

Special Project Specifications. The specifications that detail the conditions and requirements peculiar to the individual project, including additions and revisions to Standard Specifications.

Specifications. A description of the technical requirements for a material, product, or service that includes criteria for determination whether these requirements are met.

Standard Specifications. Specifications approved for general application and repetitive use.

Subbase. The layers of specified or selected material of designed thickness placed on a subgrade to support a base course.

Subgrade Treatment. Modification of roadbed material by stabilization.

Subgrade. The layers of roadbed that bring it up to the top surface, upon which subbase, base, or surface course is constructed. For roads without base course or surface course, that portion of roadbed prepared as the finished wearing surface. (See figure 102-1.)

Substructure (Bridge). All of that part of the structure below the bearings of simple and continuous spans, skewbacks of arches, and tops of footings of rigid frames, together with the backwalls, wingwalls, and wing protection railings.

Superstructure (Bridge). The entire structure except the substructure.

Surface Course. The top layer of a pavement structure, sometimes called the wearing course, usually designed to resist skidding, traffic abrasion, and the disintegrating effects of climate. (See figure 102-1.)

Tackifier. Binder for vegetative mulch.

Target Value. The percentage of each material in a mixture intended for a particular use from which allowable variations are measured.

Timber Sale Contract. A written contract for the removal of National Forest timber.

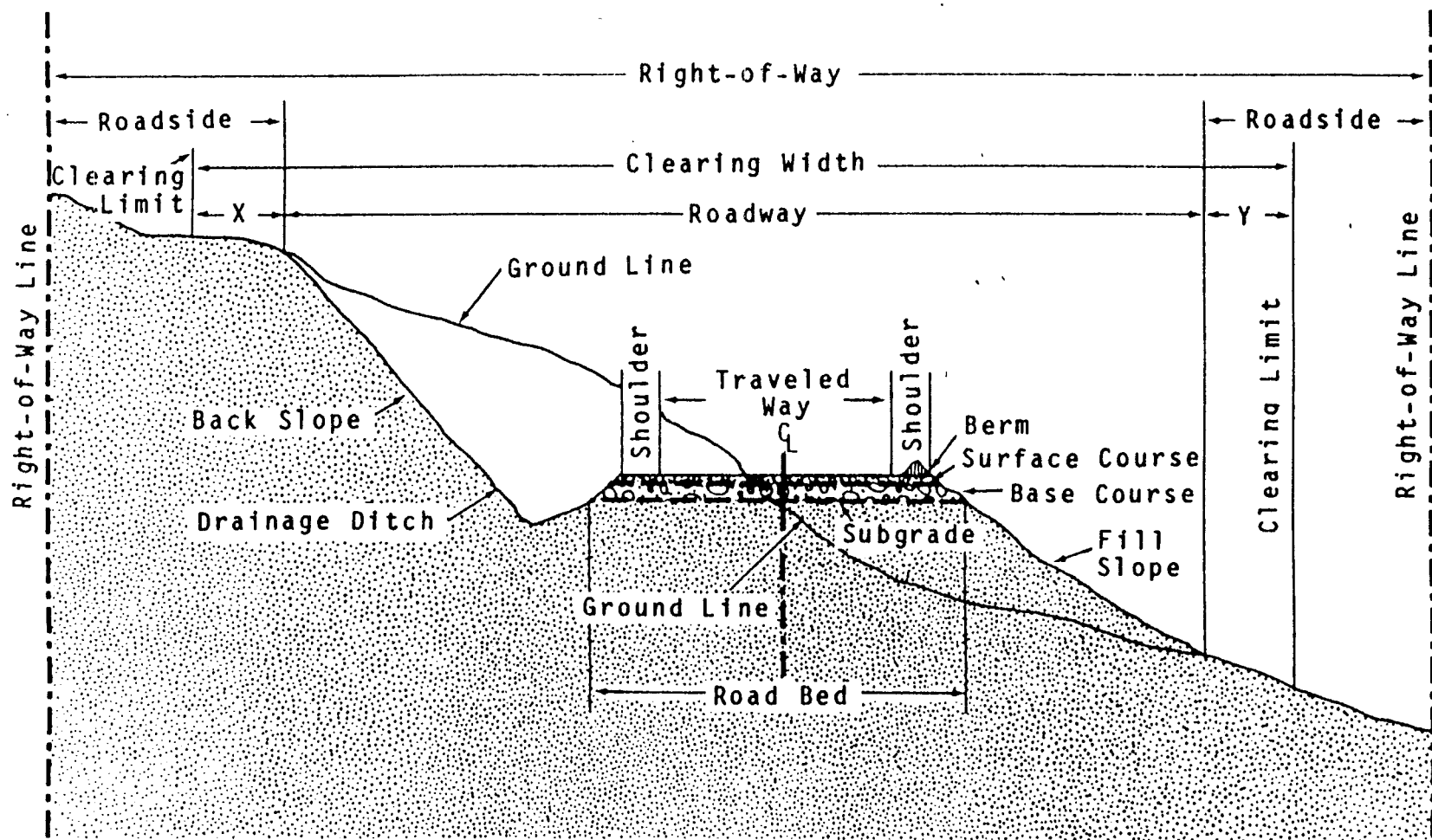
Traveled Way. The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes. (See figure 102-1.)

Turnout. A short auxiliary lane on a one-lane road provided for the passage of meeting vehicles.

Unit of Measurement. The unit and fractions of units shown in the Schedule of Items.

Unsuitable Material. The material excavated during roadway construction that is not usable in embankment and must be disposed of or that can be used only in certain locations or for limited purposes.

Utilization Standards. The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.



Note: Shapes and dimensions will vary to fit local conditions.
See drawings for typical sections.
X and Y denote clearing outside of roadway.

Figure 102-1.--Illustration of road structure terms.

Section 103 - Intent of Contract

The intent of the contract is to provide for the complete construction of the project described in the contract. Unless otherwise provided, the contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies, and shall perform all work required to complete the project reasonably close conformity with drawings and specifications, and in accordance with provisions of the contract.

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Section 104 - Maintenance for Traffic

104.01 Roads To Be Constructed

Unless otherwise provided in the SPECIAL PROJECT SPECIFICATIONS, existing roads, while undergoing improvement, shall be kept open to all traffic by the contractor and maintained in a condition that will adequately accommodate traffic. No work that interferes or conflicts with traffic or existing access to the roadway surface shall be performed until a plan for the satisfactory handling of traffic has been submitted by the contractor and approved by the Engineer. Specific requirements for temporary closures, detours, part-width construction and access to adjacent or intersecting facilities will be SHOWN ON THE DRAWINGS or described in SPECIAL PROJECT SPECIFICATIONS. Construction signing for traffic control shall conform to the Manual on Uniform Traffic Control Devices (MUTCD).

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.02

Prior to the contractor shutting down any operations, the contractor shall take such precautions as may be necessary to prevent damage to the project, such as temporary detours, approaches, crossings or intersections; and shall make provisions for normal drainage and minimization of erosion. All travelways shall be left in a condition suitable for traffic.

The Government may permit use of portions of the project during periods that the contractor has shut down operations. All maintenance attributable to permitted use during periods of work suspension will be provided by the Government unless the maintenance results from fault or negligence of the contractor. Any maintenance not attributable to use, or necessary during suspensions resulting from fault or negligence of the contractor, shall be the contractor's responsibility.

104.02 Use of Roads by Contractor

The contractor is authorized to use Forest Service roads for all activities necessary for completion of this contract subject to the limitations and authorizations described in SPECIAL PROJECT SPECIFICATIONS, when such use will not cause damage to the roads or National Forest resources and when traffic can be accommodated safely.

Section 170 - Construction Staking, Transit L-Line

DESCRIPTION

170.01
Work

This work shall consist of the construction staking of a road project by the Transit L-line method in accordance with the drawings and specifications. The work includes furnishing all labor, equipment, instruments, materials, transportation, and other incidentals necessary to complete the construction staking in accordance with these specifications and acceptable engineering practice. The work shall also include setting grade-finishing stakes and staking major structures when required.

Construction staking shall be accomplished under the direction of a registered professional engineer or land surveyor. The professional engineer or land surveyor will be closely associated and familiar with the construction staking; periodic visits to the project site are required.

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.01

MATERIALS

170.02
Stakes

All stakes shall have the nominal dimensions SHOWN ON THE DRAWINGS or stated in the SPECIAL PROJECT SPECIFICATIONS. Identification stakes and hubs shall be of sufficient length to provide a solid set in the ground and to provide space for marking above ground when applicable. Other dimensions and materials may be used, such as steel reinforcing bars, wire flagging and markers, and metal pins, if approved in writing by the Engineer. The top 2 inches of all slope, guard, reference, clearing, and structure stakes shall be painted or marked with plastic flagging. Colors used on stakes or for flagging shall be as SHOWN ON THE DRAWINGS or stated in SPECIAL PROJECT SPECIFICATIONS.

170.03
Survey Note
Paper & Books

Paper for survey notes shall be moisture-resistant paper. Notes shall be contained in books with covers that will protect the contents and retain the pages in numerical sequence during field use. Field notebooks or note paper shall be furnished by the contractor.

170.04
Government
Furnished Documents

The contractor will be furnished drawings, P-line survey notes, P-line to L-line offset data, construction staking notes, and the projected locations of catch points. One set of "as staked" drawings and all documents shall be returned to the Engineer.

SURVEY REQUIREMENTS

170.05
Precision

Precision and accuracy requirements are contained in tables 170-1 and 170-2. All work performed under this specification shall meet the precision requirements DESIGNATED in the SCHEDULE OF ITEMS or stated in the SPECIAL PROJECT SPECIFICATIONS.

170.06
Survey Notes

All notes shall become the property of the Forest Service. Slope stakes note format shall conform to that shown in figure 170-2. Other formats may be used if approved by the Engineer.

Manually recorded survey notes shall be printed in characters at least 0.15 inches high and shall be legible at a distance of 2.5 feet. Errors shall be deleted by lining out. Date, crew names and positions, instrumentation, and weather shall be recorded in the notes at the beginning of each day's work. The party chief shall sign or initial each page of the notes immediately after the last entry for each day's work.

Electronically recorded survey notes shall be consecutively numbered and headed to identify the contents. The notes shall be supported and accompanied by a bound Day Book that records the project name and for each day identifies date, crew names and positions, instrumentation, weather, type of survey, stationing of sections between which survey was performed, and survey data or

sketches that cannot be electronically recorded. The party chief shall sign or initial the electronically recorded notes and Day Book immediately after the last entry for each day's work.

170.07
Preliminary
Survey Line

A preliminary survey line has been established on the ground for this project with initial and specific succeeding survey points referenced. The contractor shall reestablish missing P-line points necessary to control subsequent construction staking operations to the precision designated in the SCHEDULE OF ITEMS, SHOWN ON THE DRAWINGS, or stated in the SPECIAL PROJECT SPECIFICATIONS.

170.08
Establishing
Centerline

The contractor shall determine the direction of centerline (L-line) tangents by coordinate ties furnished by the Forest Service. At least two points shall be located on each tangent to establish the direction of each tangent. The location of tangent lines established on the ground shall not be changed.

The deflection angle from one tangent to another shall be measured. When the measured deflection angle differs from the one SHOWN ON THE DRAWINGS, the measured angle and the curve external (E) SHOWN ON THE DRAWINGS shall be used to compute new curve data. The new curve data shall be computed and noted in the field books, and on the "as staked" drawings. The new control points (P.I., or P.C.'s & P.T.'s) shall be established on the ground using hubs and tacks.

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Stationing of centerline points shall be established by horizontal distance measurements and staked to the nearest 0.01 foot for control points and 0.1 foot for other points continuously throughout the project. Equations shall be introduced at the P.T. of curves to adjust field stationing to that SHOWN ON THE DRAWINGS when the difference between designed and located centerline stationing exceeds 5 feet. Centerline stakes shall be set at even 100-foot and 50-foot stations when practicable, at significant breaks in the ground, at culvert locations, at station equation points, or other stations indicated in the staking notes. Stakes shall not be more than 50 feet apart. Curves of 20 degrees or more shall be staked every 25 feet. All other curves shall be staked every 50 feet.

Where centerline stations fall in an existing trail, obstruction, or roadway, stakes shall be offset left or right from centerline (perpendicular to tangents and on the radial lines of curves) clear of the trail, obstruction, or roadway, and the offset distance marked on the side facing the centerline. The centerline point shall be a 20-penny or larger nail, flagged, and driven at least 1 inch below the road surface.

The survey line shall be cleared to facilitate travel and surveying. Clearing slash shall be removed from the travel or work area. All brush and trees shall be cut as near to the ground as possible.

170.09
Referencing
Centerline

The contractor shall reference centerline control points, which will be intervisible after clearing is completed to facilitate reestablishment of the centerline. References shall be measured to the precision of the centerline survey. References shall consist of two intersecting lines having an included angle of at least 30 degrees. The forward reference shall be placed a minimum of 25 feet outside the clearing limits as computed from the preliminary slope stake printout notes, and the rear hub or point on each line shall be not less than 30 feet beyond the forward hub or point. Reference points shall be marked with hubs and tacks.

170.10
Vertical Control
& "L" Profile
Levels

Bench marks established during the P-line survey that are within the clearing limits shall be relocated to points 20 feet or more outside the clearing limits. Elevation of relocated bench marks shall be determined by closed level circuits.

Bench marks shall be constructed to be permanent and to allow a level rod to stand vertically and squarely on the mark. Bench marks may be established by driving a 40-penny or larger nail into a notch cut in the base of a tree, by marking a point on a stable rock, or by other approved means. Spikes in trees shall be less than 12 inches above the ground. Location and descriptions of relocated bench marks shall be recorded in the level notes. At least two bench marks shall be set at each bridge and structural plate culvert site.

A closed level circuit shall be run over the L-line stations between bench marks to determine centerline ground elevations to the nearest 0.1 foot and to verify bench marks.

170.11
Discrepancies

The contractor shall compare the staked centerline horizontal and vertical alignment with the design data. Differences between previously recorded and observed elevations of bench marks shall be referred to the Engineer. Differences exceeding 1 degree in angle found between the horizontal alignment data SHOWN ON THE DRAWINGS and the alignment observed on the ground shall be referred to the Engineer. Differences in centerline profile elevations exceeding 1 foot at any two or more consecutive points shall be reported to the Engineer for evaluation and possible revision. Staking of these areas shall be deferred until these differences are resolved by the Engineer.

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170.12
L Topography
Cross Sections

Cross sections shall be taken at right angles to tangents and normal to curves at every staked point on the "L" profile line. The contractor shall determine the elevations of significant breaks in topography, breaks in the designed roadway template, and cross-section reference points. Ground shots for these cross sections shall be recorded in terms of feet plus or minus from ground at centerline, and horizontal distances from centerline. Cross sections shall be measured and recorded to the nearest 0.1 foot in elevation and nearest foot in horizontal distance, and shall extend approximately 20 feet beyond the designed clearing and grubbing limit on cut sections and approximately 20 feet beyond the toe of fill on fill sections.

Cross sections shall be identified at each end of the cross section with lath marked to show centerline station and the horizontal and vertical distance to the centerline.

Cross-section data shall be returned to the Engineer for recomputation of earthwork quantities and slope stake "catchpoint" printouts.

Slope stakes established during the "L" topography cross section phase of the work may be subject to relocation to adjust earthwork quantities.

170.13
Slope Stakes,
Clearing Limits,
& Reference
Stakes

Slope catchpoints, clearing limits, and slope reference stakes shall be established on both sides of the centerline at each "L" station established. The position of these stakes shall be determined by methods that will produce on the ground the designed template shown in the slope stake survey notes to the precisions shown in table 170-2 and specified for this contract. The slope stake "catchpoint distance" shown in the printout may be used as a trial location to initiate slope staking.

The cut or fill and horizontal distance to centerline, to bottom of ditch, or to shoulder as DESIGNATED by the Engineer shall be recorded on the slope stakes and in the slope stake notes as shown on figure 170-2.

Clearing limits shall be set on both sides of the centerline at each established "L" station within the tolerance shown on table 170-2. The clearing limit shall be located on the ground to the dimensions SHOWN ON THE DRAWINGS and marked with lath, flagging, or other methods approved by the Engineer. The total horizontal

distance from the centerline to the clearing limit at each section shall be recorded to the nearest foot in the field book.

The contractor shall establish slope reference stakes at a minimum horizontal distance of 10 feet outside the clearing limits and record on the stakes the horizontal distance to centerline and the vertical distance to the construction grade. The offset from the slope stake catchpoint, and slope stake catchpoint information as shown in figure 170-2, shall also be recorded on the reference stake, and in the slope stake book.

The elevation and location of slope reference stakes shall be verified for accuracy by:

(a) For Precision A. A differential level run over the reference stakes between bench marks.

(b) For Precisions B & C. Differential leveling between slope reference stakes of adjacent sections.

Where the difference in reference stake elevation between that established by slope staking and that observed by differential leveling exceeds the allowed tolerance, the slope stake shall be reset.

If property boundary or survey monuments, or survey markers of other agencies, are found within or adjacent to the construction limits, the contractor shall immediately notify the Engineer.

170.14
Monuments of
Property
Boundaries or
Surveys of Other
Agencies

170.15
Staking Culverts

Slope stakes and slope reference stakes shall be set at all culvert locations. A culvert reference stake and hub shall be set on the centerline of the culvert 10 feet from each end or beyond the clearing limit, whichever is greater. The following shall be recorded on these stakes:

(a) Diameter, actual field measured length, and type of culvert.

(b) The vertical and horizontal distance from hubs to the invert at the ends of the culvert.

When SHOWN ON THE DRAWINGS, headwalls for culverts shall be staked by setting a hub with a guard stake on each side of the culvert on line with the face of the headwall. (This work shall be performed after clearing is completed.)

170.16
Staking Drain Dips

Slope stakes and slope reference stakes shall be established on the projected centerline of the bottom of the dip at all drain dip locations as SHOWN ON THE DRAWINGS.

170.17
Staking Major
Structures

(a) Bridges. Bridge locations shall be designated on the ground by establishing reference points for the bridge centerline and the transverse centerline of one pier or abutment. Reference points shall be hubs and tacks set online beyond the construction limits and marked to identify the point and distance to the point referenced. At least one bench mark shall be set on each side of the stream beyond construction limits but close enough to the bridge site to allow direct leveling between the bench marks and the bridge without an intermediate setup. All of the above information shall be recorded in a separate book that includes a sketch showing the stream, bridge, and location of all construction stakes set. Staking shall be done to the accuracy standards shown in table 170-1.

(b) Cattleguards. Cattleguards shall be staked as SHOWN ON THE DRAWINGS.

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(c) Other Structures. When required, other structures shall be staked as described in SPECIAL PROJECT SPECIFICATIONS and/or as SHOWN ON THE DRAWINGS.

170.18
Grade Finishing
Stakes

Finishing stakes shall be set when shown in the SCHEDULE OF ITEMS. Subgrade finishing stakes shall be blue tops. Base course finishing stakes shall be red tops.

Stakes shall be nominal 1-inch by 1-inch hubs and shall be of sufficient length to provide a solid set.

Finishing stakes shall be placed on the staked cross section and road template line. A stake shall be set at each shoulder and at centerline. Additional stakes shall be set when SHOWN ON THE DRAWINGS.

Finishing stakes shall be set when subgrade is within 0.5 feet, or base course is within 0.2 feet of final grade. The stakes shall be set to the nearest 0.02 feet of the measured grade line.

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170.19
Marking Stakes

All stakes shall be legibly marked in the format shown in figure 170-1 with a stake pencil that leaves an imprint or with waterproof ink. Marking shall conform to the nomenclature below:

PI	Point of intersection of tangents
PC	Point of curvature
POC	Point on curve
PT	Point of tangency
POT	Point on tangent
RP	Reference point
P	P-line (preliminary location line)
L	L-line (final location line)
BM	Bench mark
TBM	Temporary bench mark
BT	Begin taper (any)
ET	End taper (any)
BFTO	Begin full turnout
EFTO	End full turnout
BFEW	Begin full extra widening
EFEW	End full extra widening
DD	Drain dip
C	Cut
F	Fill
CL	Centerline
D	Ditch
W	Width

170.20
Stake Approval
& Maintenance

Construction work shall not begin within a roadway segment until the stakes, marks, and controls established by the contractor have been approved in writing by the Engineer. The minimum segment for approval shall be 2,000 feet or the length of the project, whichever is less.

Approval of the construction staking will not relieve the contractor of the responsibility for maintaining the survey work and for correcting errors, whether the errors are discovered during the actual survey work or in subsequent phases of the project. Stakes within the roadway need not be maintained after clearing operations have started.

MEASUREMENT

170.21
Method

The method of measurement, described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Reestablishing P-line includes all work needed to replace missing portions of the P-line that are necessary for the determination of L-line tangents. When listed in the SCHEDULE OF ITEMS, the quantity shall be the number of stations, measured to the nearest 0.1 station, of P-line reestablished. When the length of P-line

to be replaced does not exceed 10 percent of the measured length of the L-line, reestablishing P-line will be considered incidental to establishing centerline, and no separate payment will be made.

Establishing centerline includes all work necessary to establish and reference the centerline, establish vertical controls, determine the centerline profile elevations, and cross-section the original ground from the centerline datum established by this survey. The quantity shall be the number of miles measured to the nearest 0.01 mile of centerline completed and accepted.

Slope staking includes all work necessary to establish slope stakes, clearing limits, and reference stakes from a previously established centerline. The quantity shall be the number of miles, measured to the nearest 0.01 mile, of previously established centerline completed and accepted.

Finish staking includes all work necessary to reestablish the centerline to control placement of finish stakes and set the finish stakes. The quantity shall be the number of miles, measured to the nearest 0.01 mile, of previously established centerline completed and accepted.

Staking major structures includes all work necessary to establish lines and grades for the construction of the structure(s). The quantity shall be the actual number of structures of the type shown in the SCHEDULE OF ITEMS completed and accepted.

PAYMENT

170.22
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
170(01) Reestablish P-line, Precision _____	STA.
170(02) Establish Centerline, Precision _____	MI.
170(03) Slope Staking, Precision _____	MI.
170(04) Finish Staking, Subgrade, Precision _____	MI.
170(05) Finish Staking, Base Course, Precision _____	MI.
170(06) Staking Major Structure(s), Type _____, Precision _____	EA.

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.22

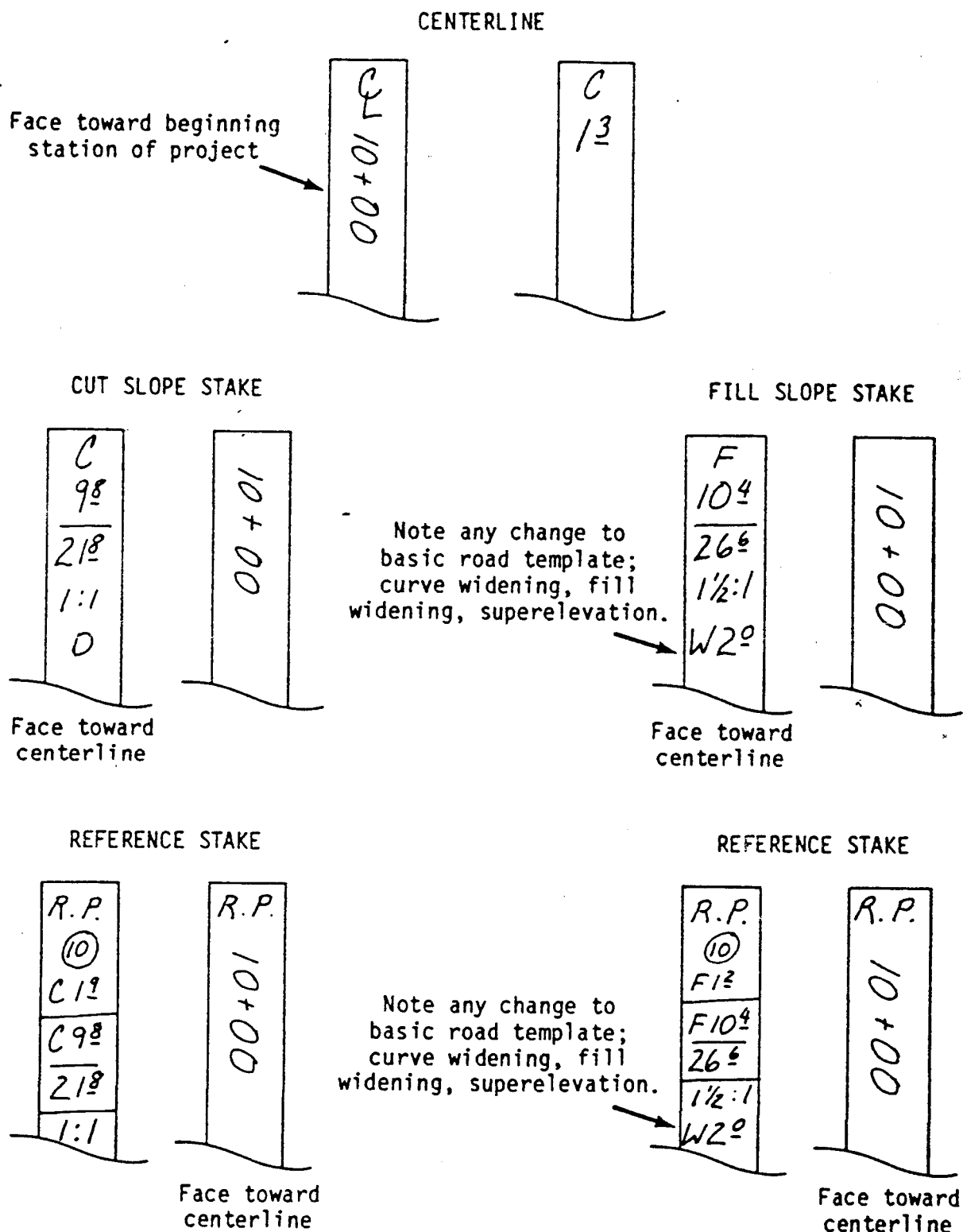


Figure 170-1.--Construction stakes.

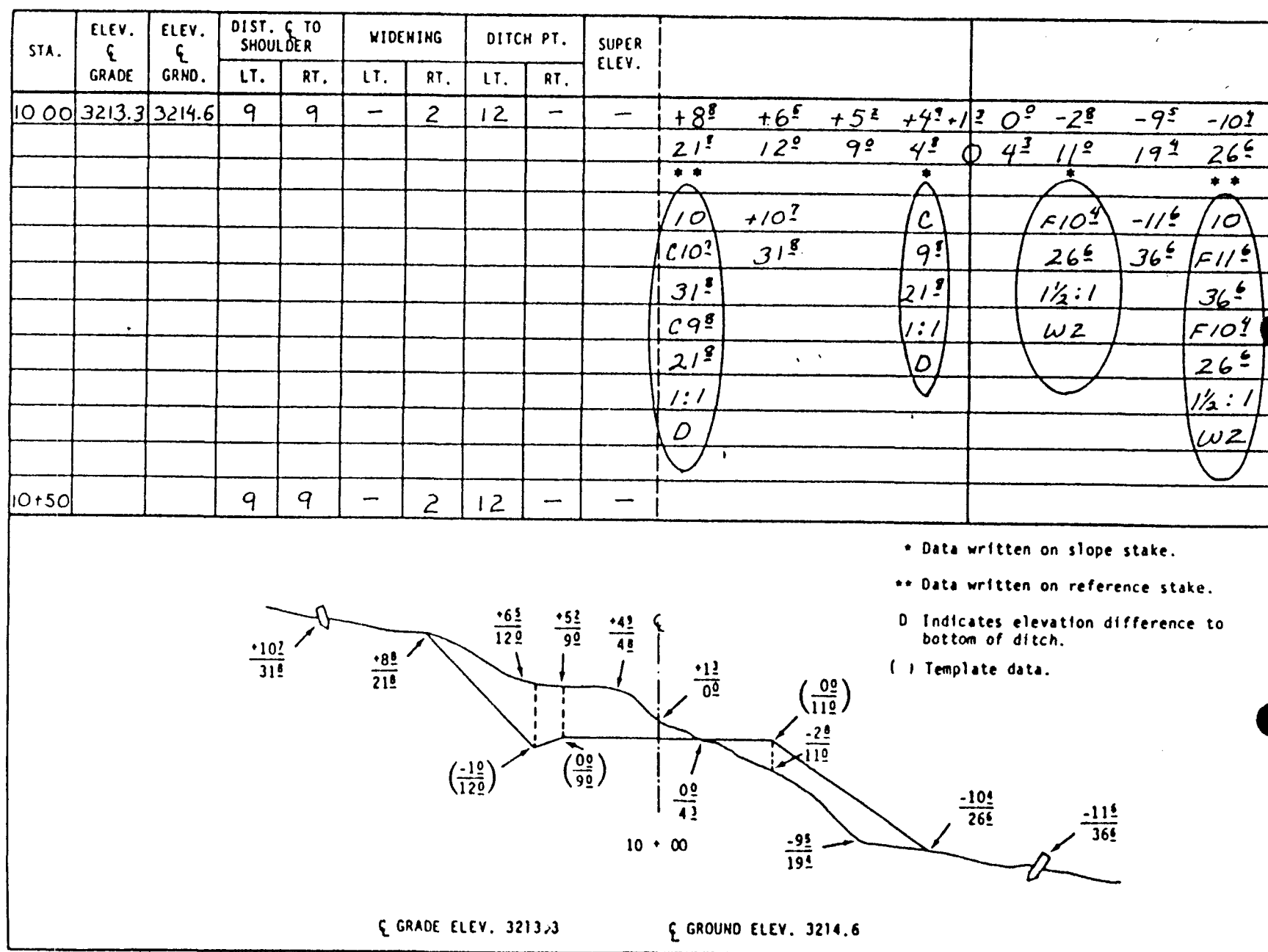


Figure 170-2.--Slope-stake note entries related to actual ground elevations.

Table 170-1.--Accuracy requirements for reestablishing P-line, traverse, and level circuits.

Precision Class	Minimum Position Closure	Angular Accuracy	L-Line Tangent Control Points ^a	Vertical Closure ^b
A (Bridges)	1/10,000	2 sets, direct/reverse 10" rejection limit	N/A	$0.035 \sqrt{M}$ or 0.002/sta. ^c
B	1/5000	2 sets, direct/reverse 20" rejection limit	0.1'	$0.05 \sqrt{M}$ or 0.02 ft/sta. ^c
C	1/1000	1 set, direct/reverse 1' rejection limit	0.2'	$0.10 \sqrt{M}$ or 0.05 ft/sta. ^c

^aAccuracy of offset measurement.

^bM is number of miles in traverse.

^cUse least value.

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.22

Table 170-2.--Cross section and slope-stake precision.

Item	Precision		
	A	B	C
Allowable deviation of cross section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves.	$\pm 2^\circ$	$\pm 3^\circ$	$\pm 3^\circ$
Cross section topography measurements shall be taken so that variations in ground from a straight line connecting the cross section points will not exceed:	0.5 ft	1.0 ft	2.0 ft
Horizontal and vertical accuracy for cross sections. In feet or percentage of horizontal distance measured from traverse line, whichever is greater.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%
Horizontal and vertical accuracy for slope stake, slope stake references, and clearing limits. In feet or percentage of horizontal distance measured from centerline or reference stake, whichever is greater.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%
a. Slope reference stakes and slope stakes.	1.0 ft	1.0 ft	1.0 ft
b. Clearing limits.	1.0 ft	1.0 ft	1.0 ft

Section 201 - Clearing & Grubbing

DESCRIPTION

201.01
Work

This work shall consist of clearing, grubbing, trimming, removing, and disposing of or treatment of timber, construction slash, and debris. This work shall also include preservation of vegetation and objects DESIGNATED to remain from injury or defacement.

CONSTRUCTION

201.02
Clearing & Grubbing

All debris, trees, stumps, roots, and other protruding vegetative material within the clearing limits, not DESIGNATED to remain, shall be cleared, grubbed, removed, and disposed of, except the following:

(a) Undisturbed stumps outside the roadway or in embankment areas, provided they do not extend more than 12 inches above the original ground (measured from the uphill side) nor closer than 2 feet to the finished subgrade or 1 foot to any slope surface or as otherwise SHOWN ON THE DRAWINGS and they do not interfere with the placement or compaction of embankments.

(b) Grubbing of pits, channel changes, rock sections, and ditches, below the depth of the proposed excavation.

All roots over 3 inches in diameter within the roadbed area shall be grubbed to a minimum depth of 6 inches below subgrade. Roots over 3 inches in diameter protruding from the excavated slope shall be cut flush with the excavated slope surface. 201 .03

Unless shown otherwise in the SPECIAL PROJECT SPECIFICATIONS, trees shall be felled into the area being cleared when ground conditions, tree lean, and shape of clearing permit. Controlled felling shall be used that will ensure the direction of fall when necessary to prevent damage to property, structures, trees DESIGNATED to remain, or traffic.

Fire-dangerous dead trees or unstable live trees, DESIGNATED by the Engineer within 200 feet slope distance of the centerline of roads shall be cut off not more than 12 inches above the uphill ground line and treated in accordance with Subsections 201.03 and 201.05.

Branches on remaining trees or shrubs shall be trimmed to give a clear height of 14 feet above the roadbed unless otherwise SHOWN ON THE DRAWINGS. Tree limbs shall be trimmed as near flush with the trunk as practicable.

201.03
Utilization of
Timber

Merchantable timber is timber that meets utilization standards in the SPECIAL PROJECT SPECIFICATIONS. Logging methods and utilization shall conform to the following:

(a) Felling and Bucking. Felling shall be done to minimize damage to merchantable timber and damage to remaining trees outside of clearing limits. Felling shall be done with saws or shears unless shown otherwise in the SPECIAL PROJECT SPECIFICATIONS.

Bucking shall be done to permit removal of all minimum pieces set forth in SPECIAL PROJECT SPECIFICATIONS.

(b) Utilization and Removal of Timber. Trees that equal or exceed the diameters and minimum lengths listed in the SPECIAL PROJECT SPECIFICATIONS and contain one minimum piece shall be removed or disposed of by one of the following methods as shown in the SCHEDULE OF ITEMS.

(1) The disposal of merchantable timber designated for removal shall be done in accordance with the B(BT) provisions of the Timber Sale Contract.

(2) Logs meeting utilization standards shall be limbed and decked at locations SHOWN ON THE DRAWINGS or at locations approved by the Engineer. Decking shall be done in such a manner that logs are piled parallel one to the other, can reasonably be removed by standard log loading equipment, will not damage standing trees, and will not roll. Decks shall be free of brush and soil.

(3) Removal from Government Land. Merchantable timber, designated for removal, shall become the property of the contractor without charge and removed from Government land. This timber shall not be exported from the United States nor used as substitution (as defined in 23 CFR 223.10) for timber from private lands exported by the contractor or an affiliate directly or indirectly.

(4) Disposal as Unmerchantable Timber. Timber on this project is not considered merchantable and shall be disposed of in accordance with Subsection 201.05 for the treatment methods SHOWN ON THE DRAWINGS and in the SCHEDULE OF ITEMS.

201.04
Pioneer Roads

The construction of pioneer roads shall be confined to inside the roadway unless otherwise approved by the Engineer.

201 201.05
.03 Slash Treatment

Treatment of construction slash larger than 3 inches in diameter and 3 feet in length shall be accomplished by one or more of the following methods as shown in the SCHEDULE OF ITEMS:

- (1) Windrowing Construction Slash
- (2) Windrowing of Large Material
- (3) Windrowing and Covering
- (4) Scattering
- (5) Burying
- (6) Chipping
- (7) Piling and Burning
- (8) Decking Unmerchantable Material
- (9) Disposal in Cutting Units
- (10) Removal
- (11) Piling
- (12) Placing Slash on Embankment Slopes

Pieces of wood less than 3 inches in diameter and 3 feet in length may be scattered within the clearing limits.

(a) All Methods. No construction slash shall be deposited in lakes, meadows, streams, or streambeds. Construction slash that interferes with drainage structures shall be removed immediately.

Trees adjacent to the clearing limits scorched or damaged beyond recovery shall be felled and disposed of in accordance with Subsection 201.03 or treated as construction slash.

(b) Specific Methods

(1) Windrowing Construction Slash. Unless specified otherwise in the SPECIAL PROJECT SPECIFICATIONS, the contractor

shall meet the following requirements. Areas used to windrow construction slash shall be cleared to accommodate the windrow. Construction slash shall be placed outside the roadway in neat, compacted windrows laid approximately parallel with and along the toe-line of embankment slopes. The top of windrows shall not extend above the subgrade. All material in the windrow shall be matted down with construction equipment to form a compact and uniform pile. Windrows shall have 16-foot minimum length breaks at least every 200 feet. Windrows shall not be placed against trees. A pioneer road may be constructed to provide an area for placement of windrows provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.

(2) Windrowing of Large Material. Construction slash 10 inches or more in diameter at the small end and 6 feet or more in length shall be windrowed as in (1) above. Smaller material shall be treated by one or more of the other included methods for slash treatment.

(3) Windrowing and Covering. Construction slash shall be placed and compacted as in (1) above and shall be covered with at least 6 inches of rock and soil to form a smooth and uniform windrow.

(4) Scattering. Unless specified otherwise in the SPECIAL PROJECT SPECIFICATIONS, the contractor shall meet the following requirements. Construction slash shall be scattered outside the clearing limits without damaging trees. All logs shall be limbed. Logs and stumps shall be placed away from trees, positioned so they will not roll, and not be placed on top of one another. Other construction slash shall be limbed and scattered to reduce slash concentrations.

201
.05

(5) Burying. Construction slash shall be buried at the locations SHOWN ON THE DRAWINGS and DESIGNATED on the ground. Construction slash shall be matted down in layers and covered with at least 2 feet of rock and soil. The final surface shall be smoothed and sloped to drain.

(6) Chipping. Construction slash up to at least 4 inches in diameter and longer than 3 feet shall be processed through a chipping machine. Chips shall be deposited on embankment slopes or outside the roadway to a loose depth not exceeding 6 inches. Minor amounts of chips may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.

(7) Piling and Burning. Construction slash shall be deposited in areas SHOWN ON THE DRAWINGS and DESIGNATED on the ground. Piles shall be constructed so that burning does not damage standing trees. If burning is incomplete, the slash remaining shall be repiled and burned until pieces are reduced to less than 3 inches in diameter and 3 feet in length. These pieces shall then be scattered.

(8) Decking Unmerchantable Material. Logs not meeting utilization standards in Subsection 201.03 and other material that exceeds the diameter and length shown in the SPECIAL PROJECT SPECIFICATIONS shall be decked in areas SHOWN ON THE DRAWINGS. Other locations may be approved by the Engineer.

Material shall be cut into lengths not to exceed 32 feet and all limbs removed. Decks shall be stable and free of brush and soil. Other material shall be treated according to slash treatment methods SHOWN ON THE DRAWINGS and in the SCHEDULE OF ITEMS.

(9) Disposal in Cutting Units. Construction slash from within cutting units and 200 feet adjacent thereto shall be disposed of with logging slash. Such construction slash shall be deposited at least 50 feet inside the cutting unit boundary in

such a manner that it will not inhibit logging of the unit and that it may be treated by the prescribed logging slash treatment method.

(10) Removal. Construction slash shall be removed or hauled to locations SHOWN ON THE DRAWINGS and DESIGNATED on the ground.

(11) Piling. Construction slash shall be piled in areas SHOWN ON THE DRAWINGS and DESIGNATED on the ground for later burning or disposal by others. Piles shall be placed and constructed so burning will not damage remaining trees. All stumps shall be reasonably free of dirt. Unmerchantable logs shall be cut into lengths less than 20 feet prior to placement in the pile.

(12) Placing Slash on Embankment Slopes. Construction slash shall be placed on completed embankment slopes to reduce soil erosion where SHOWN ON THE DRAWINGS. Construction slash shall be placed as flat as practicable on the completed slope. Slash shall be placed from the toe of the embankment to a point at least 2 feet below subgrade elevation. Priority for the use of available slash shall be given to (1) through fills, (2) inside of curves, and (3) ditch relief outlets.

MEASUREMENT

201.06
Method

201
.05

The method of measurement, described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Linear measurements will be horizontal along the road centerline.

Quantities will be number of acres and fractions thereof within the clearing limits, regardless of the amount of work required.

The quantity for individual removal of trees will be the number of trees of the various size-designations removed. Tree diameters will be measured at a height of 12 inches above the ground. Trees less than 6 inches in diameter will not be counted.

<u>Size of Least Diameter At Height of 12 Inches</u>	<u>Pay Item Designation</u>
Over 6 inches to 24 inches	Small
Over 24 inches to 40 inches	Medium
Over 40 inches	Large

When an item for "Individual Removal of Trees, Miscellaneous" is shown in the SCHEDULE OF ITEMS, measurement will be the number of trees designated to be removed regardless of size.

~~PAYMENT~~

~~201.07
Basis~~

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
201(01) Clearing and Grubbing, Slash Treatment Methods for Tops and Limbs _____, Logs _____, and Stumps _____, _____, Utilization of Timber _____	ACRE
201(02) Clearing and Grubbing, Slash Treatment Methods for Tops and Limbs _____, Logs _____, and Stumps _____, _____, Utilization of Timber _____	STA.

Section 203 - Excavation & Embankment

DESCRIPTION

- 203.01
Work
- This work shall consist of excavation and shaping of roadway, borrow excavation, drainage excavation, removal of slide material, excavation of unsuitable material, embankment construction, and disposal of all excavated material necessary for the completion of construction including roadway ditches, channel changes, furrows, slope rounding, benches, berms, dips, approaches, and subsidiary work.
- 203.02
Excavation
- Excavation shall consist of the excavation and disposal of all excavated material, regardless of its nature, that is not included under other pay items listed in the SCHEDULE OF ITEMS.
- 203.03
Borrow Excavation
- Borrow excavation shall consist of the excavation and utilization of material from sources SHOWN ON THE DRAWINGS or described in the SPECIAL PROJECT SPECIFICATIONS. Additional sources of borrow excavation will be subject to approval in advance by the Engineer. Development of sources shall be in accordance with Section 611.

CONSTRUCTION

- 203.04
203 Clearing & Grubbing
.01
- Clearing and grubbing shall be accomplished in accordance with Section 201 before work under Section 203 begins, except pioneer roads and slash disposal, and grubbing of stumps when approved by the Engineer may proceed concurrently with excavation, and the burning of slash may be delayed until weather permits. Excavation and placement operations shall be conducted so material to be treated under Section 201 will not be incorporated in the roadway.
- 203.05
Pioneering
- Pioneering operations for the top of excavation slopes, toe of embankments, or pioneer road construction shall prevent undercutting of the final excavation slope, depositing of materials outside of the roadway limits, and any restriction of drainage.
- 203.06
Utilization of
Excavated Materials
- All suitable, excavated material shall be used in the construction of embankments, subgrades, shoulders, slopes, bedding, and backfill for structures and for other purposes as SHOWN ON THE DRAWINGS.
- (a) Excess Excavation. Designed excess excavation shall be disposed of as SHOWN ON THE DRAWINGS.
- (b) Rock for Slope Protection. Excavated rock suitable for protection of embankments may be conserved and used in lieu of a DESIGNATED materials source.
- (c) Conserving Material. Material encountered in the excavation, suitable for cushion, road finishing, or other purposes, may be conserved and utilized instead of materials from DESIGNATED sources. Excessively wet material that is otherwise suitable for embankment shall be field drained and dried before placement.
- (d) Excavation of Unsuitable Material. Unsuitable material shall be excavated. Disposal will be as SHOWN ON THE DRAWINGS. Excavated areas shall be backfilled with suitable material when necessary to complete the work. Frozen material shall not be placed in embankments. Rocks that are too large to be incorporated into the embankment shall be broken for incorporation into the embankment, maneuvered to the face of the embankment and embedded so that they will not roll or obstruct the use and maintenance of the roadbed, or moved to locations approved by the Engineer.

(e) Conservation of Topsoil. When SHOWN ON THE DRAWINGS, suitable topsoil shall be removed, transported, and deposited in the DESIGNATED stockpile areas.

(f) Abandoned Structures and Obstructions. Abandoned structures and obstructions shall be treated in accordance with Section 202.

203.07
Drainage Excavation

Drainage excavation shall include construction of side ditches, minor channel changes, inlet and outlet ditches, furrow ditches, ditches constructed along the road but beyond the roadway limits, and other minor earth drainage structures as SHOWN ON THE DRAWINGS. Excavated material shall be utilized in accordance with Subsection 203.06.

203.08
Finishing Roadbed

For roads receiving aggregate base or surface course, only rocks that do not protrude above the subgrade more than one-third of the depth of the base or surface course, or 3 inches, whichever is less, may remain in place.

For unsurfaced roads, unless otherwise SHOWN ON THE DRAWINGS, the top 4 inches below the finished road surface shall not contain rocks larger than 4 inches in greatest dimension. Oversize material shall be removed, reduced to acceptable size, or covered by importing suitable material approved by the Engineer.

The subgrade shall be visibly moist during shaping and dressing. Low sections, holes, cracks, or depressions shall be brought to grade with suitable material approved by the Engineer. Final compaction of the subgrade shall meet the requirements of the embankment placing method specified.

203.09
Snow Removal

Snow or ice shall not be incorporated in the embankment. Snow shall be removed in advance of the work and deposited beyond the roadway limits in a manner that will not cause resource damage nor waste material.

203.10
Finishing Slopes

Finished slopes shall conform reasonably to the lines STAKED ON THE GROUND or SHOWN ON THE DRAWINGS. The finished slope shall be left in a roughened condition to facilitate the establishment of vegetative growth. The finish associated with template and stringline or handraking methods will not be allowed. Loose rock, loose debris, and other loose material, each of which is larger than 6 inches in diameter, shall be removed from the slope unless otherwise SHOWN ON THE DRAWINGS.

The tops of excavations, excluding areas of solid rock, shall be blended with the adjacent terrain by rounding where SHOWN ON THE DRAWINGS. Decomposed rock that may be cut without blasting or ripping shall be rounded. Earth overlying rock shall be rounded above the rock.

All rock excavations that require blasting shall be formed with controlled blasting techniques unless otherwise SHOWN ON THE DRAWINGS. Controlled blasting is defined as the controlled usage of explosives and blasting accessories in appropriately aligned and spaced drill holes for the purpose of producing a free surface or shear plane in the rock excavation slopes and of minimizing landscape damage, adjacent ground vibration, and overbreak. Presplitting is not intended unless SHOWN ON THE DRAWINGS and described in the SPECIAL PROJECT SPECIFICATIONS.

Unless directed otherwise by the Engineer, the contractor shall drill, blast, and excavate short test sections (not to yield in excess of 1,000 cubic yards) to determine the controlled blasting method, hole spacing, and charge best suited to the material encountered.

203.11
Overbuilding &
Landscape & Stream
Protection

Unless otherwise agreed to by the Engineer, excavation or embankment material shall be confined within the roadway limits to avoid overbuilding and to protect the landscape and streams.

203
.11

203.12
Subgrade Treatments

Subgrade treatment shall consist of soil modification by admixing aggregates, placing geotextiles, fiber mat, wood corduroy, rock blanket, or other similar materials over areas of unsuitable embankment foundation material that are SHOWN ON THE DRAWINGS. The construction and material requirements for the type of subgrade treatment will be specified in the SPECIAL PROJECT SPECIFICATIONS or SHOWN ON THE DRAWINGS.

203.13
Earth Berms

Permanent earth berms shall be constructed along the shoulder of the traveled way at locations SHOWN ON THE DRAWINGS. Material used in the construction of berms shall be well graded with no rocks having a dimension greater than one-fourth the height of the berm.

Acceptable material for the berm may be windrowed as the roadbed is constructed. When the local material is not acceptable, material shall be imported from approved sources. Material used for berm construction shall contain no frozen material, roots, sod, or other deleterious material. Material shall not be wasted over the embankment slope.

Compaction shall be accomplished by operating the spreading equipment over the full section of the berm.

203.14
Water

Water development, hauling, and application shall be in accordance with Section 207.

203.15
Embankment Placing
Methods

(a) All Methods. When an embankment is to be placed across swampy ground and removal of unsuitable material or subgrade treatment is not required, the lower part of the embankment shall be constructed in a single layer to the minimum depth necessary to support construction equipment.

(b) Specific Methods. All embankments shall be placed by one or more of the following methods as SHOWN ON THE DRAWINGS and listed in the SCHEDULE OF ITEMS:

Method 1. Side Casting and End Dumping. Embankment may be placed by side casting and end dumping. Where material containing a large amount of rock is used to construct embankments, a solid embankment shall be provided by working smaller rocks and fines in with the larger rocks and fines to fill the voids.

Method 2. Layer Placement. Surfaces steeper than a ratio of 3 horizontal to 1 vertical (3:1) upon which embankment is to be placed, shall be roughened or stepped when SHOWN ON THE DRAWINGS to provide permanent bonding of new and old materials.

Embankment shall be layer placed, except over rock surfaces, in which case material may be placed by end dumping to the minimum depth needed for operation of spreading equipment. Each embankment layer shall be leveled and smoothed before placement of subsequent layers. Hauling and spreading equipment shall be operated uniformly over the full width of each layer.

Suitable material shall be placed in layers no more than 12 inches thick, except when the material contains rock more than 9 inches in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. No layer shall exceed 24 inches before compaction.

Placing individual rocks or boulders greater than 24 inches will be permitted provided the embankment will accommodate them. Such rocks and boulders shall be at least 6 inches below subgrade. They shall be carefully distributed and the voids filled with finer material to form a dense and compacted mass.

Where material containing large amounts of rock is used to construct embankments, the layers may be of sufficient thickness to accommodate the material involved. A solid embankment with

adequate compaction shall be constructed by working smaller rock and fines in with the larger rocks to fill the voids and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

Material shall be at a moisture content suitable to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Excessively wet material shall be handled in accordance with Subsection 203.06(c).

Method 3. Layer Placement (Roller Compaction). Embankments shall be placed as specified in Method 2. Placement shall be in horizontal layers not exceeding 12 inches prior to compaction except when the material contains rock more than 9 inches in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. Compaction shall be obtained by equipment in compliance with the requirements of Subsection 212.02(a), (b), (c), or (d). Compaction equipment shall be operated over the full width of each layer until visible deformation of the layer ceases or in the case of the sheepfoot roller, the roller "walks out" of the layer. At least three complete passes shall be made.

Method 4. Controlled Compaction. Embankments shall be placed as specified in Method 2, except earth embankments shall be placed in horizontal layers not exceeding 12 inches (loose measure) and compacted. Material shall be at a moisture content suitable for attaining the required compaction. Embankments and the top 1 foot of excavation sections shall be compacted to at least 95 percent of the maximum density as determined by AASHTO T 99, Method C or D. 203 .16

The density of the embankment material will be determined during the progress of the work in accordance with AASHTO T 191, T 205 or T 238; T 217, T 239, or T 255; and T 224.

Density requirements will not apply to portions of rock embankments that cannot be tested in accordance with approved methods. When this condition exists, compaction shall be provided by working smaller rocks and fines in with the larger rocks to fill the voids and by operating equipment over the embankment materials.

Method 5. Controlled Compaction Using Density Control Strips. The embankment placement requirements for Method 4 shall apply for this method except that compaction shall be performed in accordance with Section 212. Where portions of rock embankment are constructed that cannot be tested in accordance with approved methods, each layer shall be rolled full width with the same number of passes as the adjacent embankment containing material represented by a control strip.

Method 6. Special Project Controlled Compaction. Embankments shall be placed and compacted to at least 90 percent of the maximum density determined by AASHTO T 180, Method C or D, except that compaction of not less than 95 percent of AASHTO T 180, Method C or D, shall be obtained for a minimum depth of 1 foot below subgrade for the width of the roadbed in both excavation and embankment sections.

The density will be determined during the work in accordance with AASHTO T 191, T 205 or T 238; T 217, T 239 or T 255; and T 224.

203.16
Construction
Tolerances

The tolerance class shall be as SHOWN ON THE DRAWINGS. Roadway ditches shall be constructed to flow in the direction SHOWN ON THE DRAWINGS.

Deviations shall be uniform in the direction of change for a distance of 200 feet or more along the project centerline.

Item	Tolerance Class ^a									
	A	B	C	D	E	F	G	H	I	J
Roadbed Width (Feet)	+0.5	+0.5	+1	+1	+1	+1	+1	+1.5	+1	+2
Subgrade Elevation (Feet)	±0.1	±0.2	±0.2	±0.5	±0.5	±1	±1	±1.5	±2	±3
Centerline Alignment (Feet)	0.2	0.2	0.5	0.5	1	1	1	1.5	2	3
Slopes, Excavation and Embankment (Percent Slope) ^b	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10

^aMaximum allowable deviation from construction stakes and drawings.

^bMaximum allowable deviation from staked slope measured from slope stakes or hinge points.

203.17
(Reserved)

MEASUREMENT

203.18
Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Quantities of excavation will include:

- (a) Roadway excavation.
- (b) Rock and unsuitable material below the required grade and unsuitable material beneath embankment areas.
- (c) Furrow ditches outside the roadway, except when furrow ditches are included in the SCHEDULE OF ITEMS.
- (d) Topsoil and other material removed and stockpiled as directed.
- (e) Borrow material used in the work, except when borrow is included in the SCHEDULE OF ITEMS.
- (f) The volume of conserved materials taken from stockpiles and used in the work, except topsoil included under other pay items.
- (g) Slide material not attributable to negligence of the contractor.

Quantities of excavation will not include the following:

- (a) Material used for other than approved purposes.
- (b) Unauthorized excavation or borrow.
- (c) Quantity of material excavated from slope rounding.
- (d) Overbreakage from the backslope in rock excavation requiring blasting.
- (e) Material scarified in place to receive the first layer of embankment.
- (f) Benching or stepping existing ground for embankment foundation.
- (g) Stepping or scaling cut slopes.
- (h) Oversize material removed when finishing unsurfaced roads.

When designed quantities are DESIGNATED in the SCHEDULE OF ITEMS as the method of measurement, the quantities are estimated from design data based on undisturbed ground surface elevations.

When staked quantities are shown in the SCHEDULE OF ITEMS, excavation quantities will be determined by the average end area method using slope stake information taken prior to construction.

When actual quantities are DESIGNATED in the SCHEDULE OF ITEMS as the method of measurement, preliminary cross sections or comparable measurements will be taken of the undisturbed ground surface and quantities finally measured in accordance with the following:

(a) When excavation is DESIGNATED as a pay item in the SCHEDULE OF ITEMS, final cross sections or comparable measurements will be taken of the completed and accepted work.

(b) When embankment is DESIGNATED as a pay item in the SCHEDULE OF ITEMS, measurement will be in the final position.

(c) When borrow is DESIGNATED as a pay item by the cubic yard in the SCHEDULE OF ITEMS, measurement will be in the original position.

~~PAYMENT~~

~~203.19
Basis~~

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

203
.19

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
203(01) Excavation, Placement Method 1	C.Y.
203(02) Excavation, Placement Method 2	C.Y.
203(03) Excavation, Placement Method 3	C.Y.
203(04) Excavation, Placement Method 4	C.Y.
203(05) Excavation, Placement Method 5	C.Y.
203(06) Excavation, Placement Method 6	C.Y.
203(07) Excavation, Placement Method _____ . . .	STA.
203(08) Excavation, Placement Method _____ . . .	MI.
203(09) Excavation, Placement Method _____ . . .	L.S.
203(10) Borrow Excavation, Placement Method _____	C.Y.
203(11) Borrow Excavation, Placement Method _____	TON
203(12) Unsuitable Excavation	C.Y.
203(13) Embankment, Placement Method _____	C.Y.
203(14) Embankment, Placement Method _____	STA.
203(15) Embankment, Placement Method _____	MI.

Section 206A - Excavation for Culverts & Minor Structures

DESCRIPTION

206A.01
Work

This work shall consist of all excavation for foundations of culverts and minor structures, backfilling of completed structures, and disposal of excavated material. The footing for a bottomless arch culvert shall be considered a minor structure.

This work shall include all excavation below the designed slope or subgrade line as SHOWN ON THE DRAWINGS, excavation of unsuitable foundation material, and furnishing and placing approved foundation material.

This work shall also include necessary diverting of live streams, pumping, bailing, draining, sheeting, bracing, and miscellaneous items required for execution of the work.

CONSTRUCTION

206A.02
Clearing & Grubbing

Before starting excavation in any area, all necessary clearing and grubbing in that area shall have been completed in accordance with Section 201.

206A.03
Excavation

Excavation for culverts and foundation pits for minor structures shall be excavated to the lines and grades or elevations SHOWN ON THE DRAWINGS or as DESIGNATED on the ground. Excavations shall be of sufficient size to permit the placing and backfilling of culverts, minor structures, or minor structure footings. Boulders, logs, and any other unsuitable materials encountered shall be removed and disposed of in areas SHOWN ON THE DRAWINGS.

(a) Minor Structures. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface that is level, stepped, or serrated. All loose and disintegrated rock and thin strata shall be removed. When the footing is to rest on material other than rock, excavation to final grade shall not be completed until just before the footing is to be placed. When the foundation material is soft or otherwise unsuitable, it shall be removed and replaced with approved granular material. The contractor shall notify the Engineer when each excavation is completed and will receive written approval of the excavation and the foundation material prior to placing footings.

(b) Culverts. The width of trenches in natural ground shall permit satisfactory joining and thorough tamping of the bedding material under and around the culvert, and shall be at least as wide as the culvert diameter plus 2 feet.

Where culverts are to be placed in trenches excavated in embankments, then the excavation shall be at least as wide as one diameter plus one diameter on each side.

Unsuitable foundation material shall be excavated below the invert of the culvert to an approximate depth of 2 feet and a width of at least the culvert diameter plus 4 feet. Unsuitable material shall be replaced with selected granular foundation material and compacted to obtain a uniform foundation.

Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the foundation grade for a depth of at least 1 foot. The width of the excavation shall be at least 2 feet greater than the outside width of the culvert. This excavated material shall be replaced with selected mineral soil meeting the requirements for backfill in Subsection 603.08 and compacted in accordance with Subsection 603.08.

206A.04
Utilization of
Excavated Materials

All suitable excavated material shall be utilized as backfill or embankment. No excavated material shall be placed in live streams. All surplus material shall be disposed of as SHOWN ON THE DRAWINGS. No excavated material shall be deposited in a manner that will endanger the partly finished structure.

206A.05
Backfill &
Embankments for
Minor Structures
Other Than Pipe
Culverts

Excavated areas around minor structures shall be backfilled with selected material placed in horizontal layers, not over 6 inches (loose measure) in depth, to the level of the original ground surface. Backfill shall be readily compactible material free of frozen lumps, chunks of highly plastic clay, or other objectionable material. Rocks larger than 3 inches in diameter shall not be used within 1 foot of the structure. Each layer shall be compacted in accordance with Subsection 203.15(b), Method 4.

206A.06
Bedding, Backfill,
& Embankment for
Pipe Culverts

Bedding, backfill, and embankment for pipe culverts shall be in accordance with Section 603.

206A.07
(Reserved)

MEASUREMENT

206A.08
Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Quantities of excavation will include:

(a) For box culverts, headwalls, minor concrete and stone masonry structures, and minor drainage structures other than pipe culverts, measurement will be between vertical planes 18 inches outside the base of the masonry sections SHOWN ON THE DRAWINGS or as DESIGNATED, and between the foundation grade and the natural ground surface.

(b) For pipe culverts, measurement shall be between the original ground surface, and the bottom excavations and to the minimum width required under 206A.03(b) paragraph 1, 2, 3, or 4 as applicable.

PAYMENT

206A.09
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
206A(01) Minor Structure Excavation	C.Y.
206A(02) Pipe Culvert Excavation	C.Y.
206A(03) Bedding Material	C.Y.
206A(04) Bedding Material	TON
206A(05) Foundation Material	C.Y.

206
.09

Section 304 - Aggregate Base or Surface Course

DESCRIPTION

304.01
Work

This work shall consist of furnishing, hauling, and placing aggregate base or surface course on the subgrade or base or stockpile site approved by the Engineer. Work may include additive mineral filler, or binder as specified in the SPECIAL PROJECT SPECIFICATIONS. Aggregate production shall be by pit-run, grid-rolling, screening, or crushing methods or furnished by the Government, as shown in the SCHEDULE OF ITEMS.

MATERIALS

304.02
Source

Materials shall be obtained from sources or stockpiles SHOWN ON THE DRAWINGS or other approved sources. Grid-rolling shall utilize all suitable material that can be reduced to maximum size as shown in the SCHEDULE OF ITEMS.

Development and utilization of government-furnished sources shall be in accordance with Section 611.

304.03
Gradation

Grading requirements for crushing or screening operations shall meet the requirements of Subsection 703.06.

No gradation other than maximum size will be required for pit-run or grid-rolled material. After processing on the road, all oversize material shall be removed from the road and disposed of as SHOWN ON THE DRAWINGS.

304.04
Quality

All aggregate except Government-furnished stockpiles or from designated sources shall meet the quality requirements of Subsection 703.06 unless otherwise required in the SPECIAL PROJECT SPECIFICATIONS.

304.05
Additives

Chemical additives, if required, shall meet the requirements of the following subsections: 304
.09

Magnesium Chloride	712.11
Calcium Chloride	712.02
Sodium Chloride	712.02
Hydrated Lime	712.03

304.06
Water

Water development, hauling, and application shall be in accordance with Section 207.

304.07
Mineral Filler
or Binder

Mineral filler or binder shall be added, as specified in the SPECIAL PROJECT SPECIFICATIONS, to meet quality and/or gradation requirements. Mineral filler or binder shall be added and uniformly blended on the road when pit-run, grid-rolling, or screening methods are used or when aggregate is being furnished by the Government. Mineral filler or binder shall be uniformly blended during crushing when a crusher operation is used.

CONSTRUCTION

304.08
Preparation of
Roadbed

The roadbed shall be completed in accordance with Section 203 or 306 and approved in writing by the Engineer before placing base or surface course.

304.09
Mixing & Placing

The contractor may mix the aggregate and any required additives, water, mineral filler, and binder by any one of the three following methods unless a required method is SHOWN ON THE DRAWINGS:

(a) Stationary Plant Method. The aggregate shall be mixed with other required materials in an approved mixer. Water shall be added during the mixing operation in the amount necessary to provide the moisture content for compacting to the specified

density. After mixing, the aggregate shall be transported to the jobsite while it contains the proper moisture content and shall be placed on the subgrade or base course by means of an aggregate spreader.

(b) Travel Plant Method. After the aggregate for each layer has been placed with an aggregate spreader or windrow sizing device, it shall be uniformly mixed with other required materials by a traveling mixing plant. During mixing, water shall be added to provide the necessary moisture content for compacting.

(c) Road Mix Method. After the aggregate for each layer has been placed, it shall be mixed with other required materials at the required moisture content until the mixture is uniform throughout.

The aggregate shall be spread in a uniform layer, with no segregation of size, and to a loose depth that shall have the required thickness when compacted.

If the required compacted depth of any aggregate base or surface course exceeds 6 inches, it shall be placed in two or more layers of approximately equal thickness. If the nominal maximum particle size exceeds 3 inches, the aggregate shall be placed in layers that do not exceed twice the maximum size of the aggregate size specified.

Hauling equipment shall be operated over the surface of the previously constructed layer in a dispersed manner to minimize rutting or uneven compaction.

The aggregate shall be compacted by one of the following methods as specified on the SCHEDULE OF ITEMS:

Compaction A. Aggregate shall be compacted by operating spreading and hauling equipment over the full width of each layer of the aggregate.

Compaction B. Aggregate shall be moistened or dried to a uniform moisture content suitable for compaction. Rollers meeting the requirements of Subsection 212.02(b), (c), or (d) shall be operated over the full width of each layer until visual displacement ceases, but not fewer than three complete passes.

Compaction C. Each layer of aggregate shall be compacted to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, Method C or D.

Compaction D. Each layer of aggregate shall be compacted to a density of at least 95 percent of the maximum density, as determined by AASHTO T 180, Method C or D.

Compaction E. Each layer of aggregate shall be compacted to at least 95 percent of the target density as determined by the control strip in Subsection 212.03.

Compaction F. Pit-run and grid-rolled produced materials shall be visually moist and compacted by operating compaction equipment defined in Subsection 212.02 over the full width of each layer until visual displacement ceases.

The surface of each layer shall be bladed during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, the density of each layer will be determined in accordance with ASSHTO T 191, T 205 or T 238; T 217, T 239 or T 255; and T 224.

304.10
Compaction

304
.09

304.11
Stockpiling

If shown in the SCHEDULE OF ITEMS or if the contractor elects to produce and stockpile aggregates prior to placement, the aggregates shall be handled and stockpiled in accordance with the requirements of Subsection 105.01. Stockpile sites shall be at locations as SHOWN ON THE DRAWINGS or approved by the Engineer.

Clearing and grubbing of stockpile sites, if required, shall be in accordance with Section 201.

304.12
Thickness
Requirements

The thickness of the compacted nominal aggregate shall not vary more than 1/2 inch for aggregates with a maximum particle size of 1 inch or less, nor more than 1 inch for aggregates with a nominal maximum particle size greater than 1 inch from the thickness SHOWN ON THE DRAWINGS. The compacted thickness shall not be consistently above or below the specified thickness.

304.13
(Reserved)

MEASUREMENT

304.14
Method

The method of measurement as described in Section 106 will be DESIGNATED in the SCHEDULE OF ITEMS.

Aggregate quantities will include mineral filler or binder.

PAYMENT

304.15
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

<u>Pay Item</u>	<u>Pay Unit</u>
304(01) Pit Run Aggregate, Maximum Size _____, Compaction _____	C.Y.
304(02) Pit Run Aggregate, Maximum Size _____, Compaction _____	TON 30 .1
304(03) Pit Run Aggregate, Maximum Size _____, Compaction _____	L.S.
304(04) Grid-Rolled Aggregate, Maximum Size _____, Compaction _____	C.Y.
304(05) Grid-Rolled Aggregate, Maximum Size _____, Compaction _____	TON
304(06) Grid-Rolled Aggregate, Maximum Size _____, Compaction _____	L.S.
304(07) Screened Aggregate, Grading _____, Compaction _____	C.Y.
304(08) Screened Aggregate, Grading _____, Compaction _____	TON
304(09) Screened Aggregate, Grading _____, Compaction _____	L.S.
304(10) Crushed Aggregate, Type _____, Grading _____, Compaction _____	C.Y.
304(11) Crushed Aggregate, Type _____, Grading _____, Compaction _____	TON
304(12) Crushed Aggregate, Type _____, Grading _____, Compaction _____	L.S.

Section 603 - Metal Pipe

DESCRIPTION

603.01
Work This work shall consist of furnishing and installing, or installing only, metal pipe and pipe appurtenances, including all bedding and backfilling required to complete the work. The term metal refers to aluminum, and steel.

MATERIALS

603.02
Requirements Materials shall meet the requirements of the following Subsections:

Flexible Plastic Gaskets	705.09
Corrugated Steel Pipe and Pipe Arches.	707.01
Bituminous-Coated Corrugated Steel Pipe and Pipe Arches	707.02
Polymeric-Precoated Steel Pipe, Pipe Arches, and Underdrains	707.03
Corrugated Aluminum Alloy Culvert Pipe	707.06
Bituminous-Coated Corrugated Aluminum Alloy Culvert Pipe	707.08
Rubber Gaskets	705.03
Aluminum-Coated Type 2 Corrugated Steel Pipe and Pipe Arches	707.13
Aluminum-Zinc Coated Corrugated Steel Pipe and Pipe Arches	707.14
Bituminous-Coated Polymeric-Precoated Steel Pipe, Pipe Arches and Underdrains	707.15

Bedding material shall meet the requirements of Subsection 603.04.

Backfill materials shall meet the requirements of Subsection 603.08.

Damaged spelter coating caused by welding, field cutting, or mishandling shall be cleaned and painted as specified in AASHTO M 36.

End sections shall be constructed of a material meeting the requirements of AASHTO M 218 or AASHTO M 36.

Bituminous-coated end sections shall be coated to meet the requirements of AASHTO M 243 or AASHTO M 190.

The materials used in each pipe installation shall be compatible with each other to prevent electrolysis or physical failure.

Either annular or helical pipe corrugations will be acceptable; and helical corrugated pipe containing annular rerolled ends may be used in conjunction with annular pipe of like or compatible materials.

A fabricators Certification shall be furnished certifying that the sheet and pipe fabrication are in accordance with AASHTO M 36, M 196, and M 245 as applicable. The Certification shall be submitted prior to installation of the pipe.

The lengths and locations of individual pipe SHOWN ON THE DRAWINGS are approximate. Pipe shall not be ordered until culvert locations are DESIGNATED ON THE GROUND and a written list of the correct lengths is issued by the Engineer.

CONSTRUCTION

603.03
Excavation Excavation shall be in accordance with the requirements of Section 206A.

Pipe that is installed in or that will affect streams SHOWN ON THE DRAWINGS as important fisheries shall be installed only during those periods SHOWN ON THE DRAWINGS.

603.04
Bedding

Bedding shall consist of bedding the pipe to a depth of not less than 10 percent of its total height. The foundation surface, after excavation in accordance with Subsection 206A.03 (b), shall be compacted in accordance with Subsection 603.08 and shaped to fit the pipe.

The bedding material shall be selected mineral soil meeting the requirements for backfill in Subsection 603.08. The completed bedding shall have a longitudinal camber when SHOWN ON THE DRAWINGS.

603.05
Laying Pipe

The lower segment of the pipe shall be in contact with the bedding for the required depth throughout its entire full length. Outside circumferential laps shall be placed facing upstream.

Paved or partially lined pipe shall be laid so the longitudinal centerline of the paved segment coincides with the flowline. Elliptical pipe shall be placed with the major axis within 5 degrees of a vertical plane through the longitudinal axis of the pipe.

The final installed alignment shall be such that no reverse grades exist and no point shall vary from a straight line drawn from inlet to outlet by more than 2 percent horizontally and vertically of the culvert length or 1 foot, whichever is less, unless otherwise SHOWN ON THE DRAWINGS.

No pipe shall be placed in service until a suitable outlet is provided.

Helically corrugated lock-seam pipe shall be installed with the seam at the inlet end placed below the horizontal centerline. This requirement applies to the outlet end when the outlet is less than 5 feet below subgrade.

Longitudinal laps on riveted or spot-welded pipe shall be positioned at any location between 45 degrees above or below horizontal.

603.06
Joining Pipes

Pipe shall be firmly joined by form-fitting coupling bands. End sections shall be attached to pipe by connecting bands or other means as recommended by the manufacturer. Gaskets shall be installed at each joint to form a watertight connection when SHOWN ON THE DRAWINGS. Dimpled bands shall not be used when the slope of the pipe is greater than 15 percent.

603
.08

The coupling bands shall meet the strength requirements of field joints for Non-Erodible Soil Condition--Special Joint Type according to Division II, Section 23 of the "Standard Specifications for Highway Bridges" by AASHTO.

603.07
Shop Elongation

When SHOWN ON THE DRAWINGS, the vertical diameter of round pipe shall be increased 5 percent by shop elongation.

603.08
Backfilling

Pipe meeting any of the following conditions shall not be placed or backfilled until the excavation and foundation have been approved by the Engineer:

- (a) Embankment height greater than 10 feet at subgrade centerline.
- (b) Installation in a live stream.
- (c) Round pipe with a diameter of 48 inches or greater.
- (d) Pipe arches with a span of 50 inches or greater.

After the bedding is prepared and the pipe is placed, selected material shall be placed in layers not exceeding 6 inches loose thickness and compacted under the haunches and alongside the pipe. The material shall be readily compactible material free of frozen lumps, chunks of highly plastic clay (Plasticity Index greater than 10), or other objectionable material. Rocks larger than 3 inches in greatest dimension shall not be used within 1 foot of the pipe. On each side of the pipe there shall be an area of compacted material at least as wide as one diameter of the pipe. Backfill shall be compacted without damaging or displacing the pipe. The density shall be Method A or B as shown in the SCHEDULE OF ITEMS.

Method A. Backfill density shall exceed the density of the surrounding embankment.

Method B. Backfill density shall exceed 95 percent of the maximum density as determined by AASHTO T 99-Method C or D.

Backfilling and compacting shall be continued until the backfill is a minimum of 12 inches above the top of the culvert.

After being bedded and backfilled, pipe shall be protected by an adequate cover of embankment before heavy equipment is permitted to cross during roadway construction.

Pipe distorted more than 5 percent of nominal dimensions, ruptured, or broken shall be replaced.

603.09
(Reserved)

MEASUREMENT

603.10
Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

When shown in the SCHEDULE OF ITEMS, backfill material adjacent to the pipe will be measured 1 foot horizontally and vertically from the outside dimensions of the pipe with a deduction for the volume of the pipe along the full length of the backfill.

PAYMENT

603.11
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will made under:

<u>Pay Item</u>	<u>Pay Unit</u>
603(01) -Inch Corrugated Metal Pipe, -Inch Thickness for Steel or -Inch Thickness for Aluminum, Method 	L.F.
603(02) -Inch Span, -Inch Rise, Corrugated Metal Pipe Arch, -Inch Thickness for Steel, or -Inch Thickness for Aluminum, Method 	L.F.
603(03) -Inch Metal End Section	EA.
603(04) -Inch Span, -Inch Rise Metal End Section	EA.
603(05) -Inch Corrugated Steel Pipe, -Inch Thickness, Method 	L.F.
603(06) -Inch Span, -Inch Rise, Corrugated Steel Pipe Arch, -Inch Thickness, Method 	L.F.

Section 625 - Seeding & Mulching

DESCRIPTION

625.01
Work This work shall consist of preparing seedbeds and furnishing and placing required seed, fertilizer, limestone, mulch, and net and blanket material.

MATERIALS

625.02
Requirements Materials shall meet the requirements of the following Subsections:

Agricultural Limestone	713.02
Fertilizer	713.03
Seed	713.04
Mulch	713.05
Net and Blanket Material	713.07
Water	713.08(a)

Tackifier shall be emulsified asphalt Grade SS-1, SS-1h, CSS-1 or as specified in the SPECIAL PROJECT SPECIFICATIONS.

CONSTRUCTION

625.03
Seeding Seasons The normal seasonal dates for seeding shall be as specified in the SPECIAL PROJECT SPECIFICATIONS. Seeding materials shall not be applied during windy weather or when the ground is excessively wet or frozen. Work shall be performed during each specified seeding season on all completed and previously untreated sections.

625.04
Soil Preparation The areas to be seeded shall be finished as required by other applicable Sections to the lines and grades SHOWN ON THE DRAWINGS. Areas that are damaged by erosion or other causes shall be restored. The surface soil shall be in a roughened condition favorable for germination and growth. Limestone, when required, shall be applied uniformly either prior to or after soil preparation at the rate specified in the SPECIAL PROJECT SPECIFICATIONS.

625.05
Application
Methods for Seed,
Fertilizer,
& Limestone Material may be placed by the following methods:

(a) Hydraulic Method. The seed or seed and fertilizer shall be mixed with water in the amounts and mixtures specified in the SPECIAL PROJECT SPECIFICATIONS to produce a slurry and then applied under pressure at the rates specified in the SPECIAL PROJECT SPECIFICATIONS. When wood cellulose or grass straw mulch materials are to be incorporated as an integral part of the slurry mix, they shall be added after all other materials have been thoroughly mixed in the tank.

Legume seed shall be inoculated with approved cultures in accordance with instructions of the manufacturer. The inoculum used for hydraulic seeding shall be four times that recommended for dry seeding.

(b) Dry Method. Mechanical seeders, seed drills, landscape seeders, cultipacker seeders, fertilizer spreaders, or other approved mechanical seeding equipment shall be used to apply the seed or seed and fertilizer in the amounts and mixtures specified in the SPECIAL PROJECT SPECIFICATIONS.

Fertilizer in dry form and ground limestone shall be spread separately at the rates specified in the SPECIAL PROJECT SPECIFICATIONS and incorporated in one operation to the required depth on those areas SHOWN ON THE DRAWINGS.

Hand-operated seeding devices may be used when seed, fertilizer, and ground limestone are applied in dry form.

625.06
Application of
Mulch

(a) Hydraulic Method. Wood cellulose or grass straw fiber mulch and fertilizer may be applied in one operation by means of hydraulic equipment that uses water as the carrying agent. A continuous agitator action that keeps the materials in uniform suspension must be maintained throughout the distribution cycle. The discharge line shall provide an even distribution of the solution to the seedbed. Mulching shall not be done in the presence of free surface water. Application to areas SHOWN ON THE DRAWINGS shall start at the top of the slope and work downward. If necessary, the use of extension hoses may be required to reach the extremities of slopes. The rate of application shall be as specified in the SPECIAL PROJECT SPECIFICATIONS.

(b) Dry Method. Mulch shall be applied after seeding and fertilizing are completed, unless otherwise specified in the SPECIAL PROJECT SPECIFICATIONS. The mulch shall be applied uniformly at the rate specified in the SPECIAL PROJECT SPECIFICATIONS.

When a binder is to be used for mulch, the material shall be applied at the rate specified in the SPECIAL PROJECT SPECIFICATIONS. It shall be immediately distributed evenly over the mulch. The contractor shall prevent asphalt adhesive materials from marking or defacing structures, appurtenances, pavements, utilities, or plant growth.

625.07
(Reserved)

625.08
Installation of
Netting & Erosion
Control Blankets

Nettings and erosion control blankets shall be installed as SHOWN ON THE DRAWINGS and in accordance with the manufacturer's recommendations.

625.09
Care During
Construction

The contractor shall be responsible for protecting and caring for seeded areas until final acceptance of the work. The contractor shall repair all damage to seeded areas caused by his construction operations without additional compensation.

MEASUREMENT

625.10
Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Area computations will be upon surface measurements.

PAYMENT

625.11
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
625(01) Seeding, Hydraulic Method (without mulch)	ACRE
625(02) Seeding, Hydraulic Method (without mulch)	M.S.F.
625(03) Seeding, Hydraulic Method (with mulch)	ACRE
625(04) Seeding, Hydraulic Method (with mulch)	M.S.F.
625(05) Seeding, Dry Method (without mulch)	ACRE
625(06) Seeding, Dry Method (without mulch)	M.S.F.
625(07) Seeding, Dry Method (with mulch)	ACRE

Section 306 - Reconditioning Existing Road

DESCRIPTION

306.01

This work shall consist of reconditioning the traveled way and shoulders of an existing road; cleaning ditches and culverts, including inlets and outlets; removing slide material; scarifying and shaping the traveled way and shoulders, parking areas, turnouts, and approach road connections.

CONSTRUCTION

306.02

Performance

The traveled way and shoulders shall be scarified and shaped at locations and to the depth and width SHOWN ON THE DRAWINGS. Any rock larger than 4 inches in its greatest dimension brought to the surface during scarification shall be removed, except as provided below.

When a base or surface course is required, provisions of (a) or (b) shall apply:

(a) Rocks larger than 4 inches that do not protrude above the existing surface or the subgrade more than one-third of the depth of the base or surface course or 3 inches, whichever is less, may be left in place.

(b) Rocks with exposed surface area exceeding 2 square feet shall be removed to at least 6 inches below subgrade.

Excess materials removed shall be disposed of in areas SHOWN ON THE DRAWINGS.

Existing bituminous surfaces, SHOWN ON THE DRAWINGS, shall be scarified and pulverized until all lumps are reduced to the maximum size SHOWN ON THE DRAWINGS. The bituminous pulverized aggregate shall be incorporated into the traveled way and shoulders.

The traveled way and shoulders of intersecting roads shall be similarly treated to provide a smooth transition for the distance SHOWN ON THE DRAWINGS.

The ditches shall be graded to the typical sections and at the locations SHOWN ON THE DRAWINGS. Culverts shall be cleaned to drain.

Excess and unsuitable materials removed from the roadbed, slides, culverts, and ditches shall be disposed of as SHOWN ON THE DRAWINGS.

The traveled way and shoulders shall be shaped after scarification and compacted by one of the following, as shown in the SCHEDULE OF ITEMS.

Compaction A. By operating equipment over full width.

Compaction B. 95 percent of AASHTO T 99, Method C or D.

Compaction C. 95 percent of AASHTO T 180, Method C or D.

Compaction D. Subsection 203.15, Method 3

When compaction B or C is specified, the in-place density of the material shall be determined in accordance with AASHTO T 191, T 205, or T 238; T 217, T 239, or T 255; and T 224.

306.03

(Reserved)

306
.03

Section 640 - Road Closure Devices

DESCRIPTION

640.01
Work

This work shall consist of furnishing and installing, or installing only, road closure devices using fabricated gates and accessories, combination post and rail barriers, concrete barriers, and earth mound barriers.

MATERIALS

640.02
Requirements

Materials to be used in fabricating gates and barriers shall be as SHOWN ON THE DRAWINGS.

Metal beam elements, steel posts, structural steel and steel pipe shall meet the requirements SHOWN ON THE DRAWINGS.

All hardware shall be galvanized in accordance with AASHTO M 232 and shall meet the requirements of ASTM A 307. Plain or cut washers shall be American Standard Washers.

Timber posts, rails and lumber shall meet the requirements of AASHTO M 168. The timber specie and type and rate of preservative treatment shall be as SHOWN ON THE DRAWINGS.

Concrete shall meet the requirements of Section 602, Method B or C as SHOWN ON THE DRAWINGS.

Earth mound barriers shall be constructed as SHOWN ON THE DRAWINGS from excavated material adjacent to the barrier location or from other locations as SHOWN ON THE DRAWINGS.

CONSTRUCTION

640.03
Performance

Road closure devices shall be placed at the location SHOWN ON THE DRAWINGS. All devices shall be constructed to the dimensions SHOWN ON THE DRAWINGS.

Welding required in assembling gates shall be done in accordance with the best modern practice and the applicable requirements of AWS D1.1.

After assembly, nongalvanized steel pipe gates shall be cleaned and painted with one coat of zinc-rich primer and two coats of exterior enamel of the type and color SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

All posts shall be set vertically and embedded to the depth SHOWN ON THE DRAWINGS. Concrete for embedment shall be placed against undisturbed earth within an excavation sized to achieve the embedment dimensions. Backfill shall be compacted in 6-inch layers to finished grade.

All signs and/or reflective warning markers accessory to the road closure device as SHOWN ON THE DRAWINGS shall be furnished and installed by the contractor.

MEASUREMENT

640.04
Method

The method of measurement, described in Section 106, will be designated in the SCHEDULE OF ITEMS.

Installation of signs and/or markers shall be considered incidental to other pay items and additional payment will not be made.

PAYMENT

~~640.05~~
~~Basis~~

~~The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.~~

SECTION 400 SNOW REMOVAL

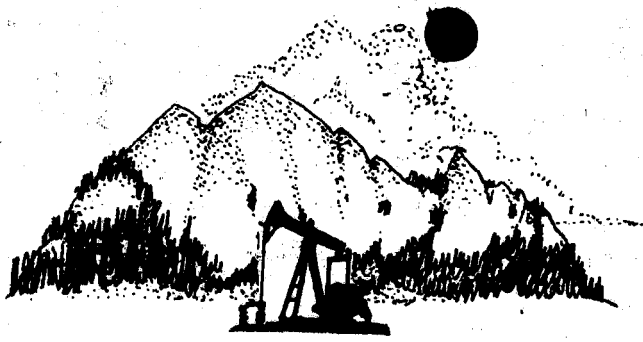
400.01 This work shall consist of the removal of snow from roads used by the permittee, when required.

400.02 SNOW REMOVAL. Snow shall be removed from the roads daily if necessary to assist in safe travel and to help eliminate road damage during snow melting periods. Snow removal by cleated vehicles will be permitted on unpaved roads. When snow removal is performed with cleated vehicles, 2" of snow cushion shall be left on the road to protect the road surface unless the surface of the road is frozen. Snow left on the road for cushioning shall be bladed off using a rubber tired snow removal equipment so that the road surface is left in a near bare condition.

Snow shall be bladed beyond the ditch line where possible. On dugway sections, snow can be pulled from the ~~S~~outside and deposited over the fill side, making certain that the ditch is clear for water to pass down the ditch.

Snow removal along through cuts or turnpike sections shall be bladed outside of the ditch section by winging the snow out. In areas where the melting snow will be trapped between snow banks, occasional cut out ditches will be bladed out, not to exceed 300' (feet) by plowing a hole out through the snow bank so that trapped water may escape the roadway prism.

Collection of snow on the road surface will not be allowed. Scarification or salting the road surface may be required to eliminate snow build up on the road surface.



DOLAR OIL PROPERTIES

9035 South 700 East, Suite 100A
Sandy, UT 84070-2418
(801) 561 - 3121

April 1, 1992

RECEIVED

APR 03 1992

DIVISION OF
OIL GAS & MINING

Mr. Frank Matthews
State of Utah
Division of Oil, Gas & Mining
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Well #17-1
SESE-17, T5S;R9W

Dear Frank:

Enclosed please find the approved Permit to Drill for the above referenced well.

Please call if you have any questions.

Yours truly,

DOLAR OIL PROPERTIES

Mark S. Dolar, CPL

MSD/df

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE
(Other instructions on
reverse side)

Form approved.
Budget Bureau No. 1004-0136
Expires August 31, 1985

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK

DRILL ☒

DEEPEN ☐

PLUG BACK ☐

b. TYPE OF WELL

OIL
WELL ☒

GAS
WELL ☒

OTHER

SINGLE
ZONE ☐

MULTIPLE
ZONE ☐

2. NAME OF OPERATOR

Global Natural Resources Corporation of Nevada

3. ADDRESS OF OPERATOR

5300 Memorial Drive, Suite 800, Houston, Texas 77007

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)*

At surface 1005 feet from South line, 109 feet from East line.
SESE

At proposed prod. zone
Same

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*

28½ miles southwest of Duchesne, Utah

15. DISTANCE FROM PROPOSED*

LOCATION TO NEAREST
PROPERTY OR LEASE LINE, FT.
(Also to nearest drig. unit line, if any) 109 feet

18. DISTANCE FROM PROPOSED LOCATION*
TO NEAREST WELL, DRILLING, COMPLETED,
OR APPLIED FOR, ON THIS LEASE, FT.

No other
locations

16. NO. OF ACRES IN LEASE

9,159.80

19. PROPOSED DEPTH

6,500 feet WST Rotary

17. NO. OF ACRES ASSIGNED
TO THIS WELL

160.00

20. ROTARY OR CABLE TOOLS

Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)

7,689 feet KB

22. APPROX. DATE WORK WILL START*

July 1, 1992

23.

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
8 5/8"	7 7/8"	15½ lb	350 feet	30 sacks of Class G cement
7 7/8"	5 1/2"	15½ lb	6500 feet	Amount determined after review of caliper log, Class G cement.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout prevention program, if any.

24.

SIGNED

MARK S. DOLAR, CPL

TITLE

Contract Landman

DATE

9/16/91

(This space for Federal or State office use)

PERMIT NO.

43-051-30017

APPROVAL DATE

APPROVED BY THE STATE

ASSISTANT DISTRICT
MANAGER MINERALS

OF UTAH DIVISION
OIL, GAS, AND MINING

APPROVED BY

CONDITIONS OF APPROVAL, IF ANY:

TITLE

NOTICE OF APPROVAL

DATE: 9/13/92
BY: [Signature]

CONDITIONS OF APPROVAL ATTACHED

*See Instructions On Reverse Side

WELL SPACING: 649-2-3

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the

UT 080-1m-226

T5S, R9W, U.S.B.&M.

Set, Marked Stone

Sec. 5
Sec. 8

Sec. 4
Sec. 9

5282.705' (Meas.)

5282.705' (Meas.)

NORTH - G.L.O. (Basis of Bearings)
15,848.12' - (Measured)

1005' (COMP.)

109' (COMP.)

5282.705' (Meas.)

Sec. 20
Sec. 29

Sec. 21
Sec. 28

Set, Marked Stone

N89°40'W - 80.20 (G.L.O.)

TIMBER CANYON UNIT #17-1
Elev. Ungraded Ground - 7689'

NOTE:
WELL LOCATION BEARS
N0°59'42"W - 6289.1'
FROM THE SOUTHEAST
CORNER OF SECTION 20.

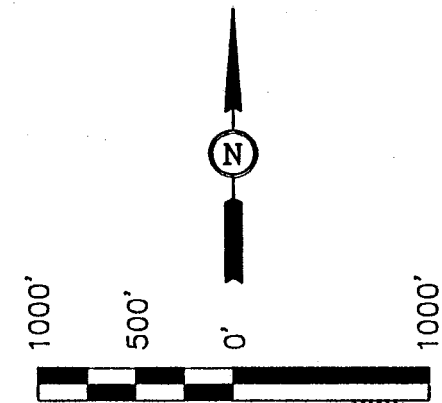
▲ = SECTION CORNERS LOCATED.

GLOBAL NATURAL RESOURCES CORP. OF NEVADA

Well location, TIMBER CANYON UNIT #17-1,
located as shown in the SE 1/4 SE 1/4
of Section 17, T5S, R9W, U.S.B.&M.
Wasatch County, Utah

BASIS OF ELEVATION

SPOT ELEVATION AT A RIDGE TOP IN THE NW 1/4
OF SECTION 17, T5S, R9W, U.S.B.&M. TAKEN
FROM THE STRAWBERRY PEAK QUADRANGLE, UTAH,
7.5 MINUTE SERIES (TOPOGRAPHICAL MAP)
PUBLISHED BY THE UNITED STATES DEPARTMENT OF
THE INTERIOR, GEOLOGICAL SURVEY. SAID
ELEVATION IS MARKED AS BEING 9327 FEET.



SCALE
CERTIFICATE
THIS IS TO CERTIFY THAT THE ABOVE PLAT WAS PREPARED FROM
FIELD NOTES OF ACTUAL SURVEYS MADE BY ME OR UNDER MY
SUPERVISION AND THAT THE SAME ARE TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE AND BELIEF
C. KAY
REGISTERED LAND SURVEYOR
REGISTRATION NO. 3132
STATE OF UTAH

UINTAH ENGINEERING & LAND SURVEYING
P. O. BOX 1758 - 85 SOUTH - 200 EAST
VERNAL, UTAH - 84078

SCALE 1" = 1000'	DATE 6-21-91
PARTY R.K. J.F. R.E.H.	REFERENCES G.L.O. PLAT
WEATHER HOT	FILE GLOBAL NATURAL RESOURCES CORP. OF NEVADA

RECEIVED

APR 03 1992

CONDITIONS OF APPROVAL
APPLICATION FOR PERMIT TO DRILL

DIVISION OF
OIL GAS & MINING

Company/Operator: Global Natural Resources Corp. of Nev.

Well Name & Number: 17-1

Lease Number: U-48776

Location: SESE Sec. 17 T. 5S R. 9W

Surface Ownership: Federal Lands administered by U.S. Forest Service

NOTIFICATION REQUIREMENTS

- | | | |
|---------------------------------|---|--|
| Location Construction | - | at least forty-eight (48) hours prior to construction of location and access roads notify U.S. Forest Service at (801) 738-2482. |
| Location Completion | - | prior to moving on the drilling rig notify U.S. Forest Service. |
| Spud Notice | - | at least twenty-four (24) hours prior to spudding the well notify BLM. |
| Casing String and Cementing | - | at least twenty-four (24) hours prior to running casing and cementing all casing strings notify BLM. |
| BOP and Related Equipment Tests | - | at least twenty-four (24) hours prior to initiating pressure tests notify BLM. |
| First Production Notice | - | within five (5) business days after new well begins, or production resumes after well has been off production for more than ninety (90) days notify BLM. |

For more specific details on notification requirements, please check the Conditions of Approval for Notice to Drill and Surface Use Program.

CONDITIONS OF APPROVAL FOR NOTICE TO DRILL

Company Global Natural Resources Corp. Well No. Timber Canyon 17-1

Location SESE, Section 17, T5S, R9W Lease No. U - 48776

Approval of this application does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Be aware fire restrictions may be in effect when location is being constructed and/or when well is being drilled. Contact the appropriate Surface Management Agency for information.

A. DRILLING PROGRAM

1. Estimated Depth at Which Oil, Gas, Water, or Other Mineral Bearing Zones are Expected to be Encountered

Report ALL water shows and water-bearing sands to Tim Ingwell of this office. Copies of State of Utah form OGC-8-X are acceptable. If noticeable water flows are detected, submit samples to this office along with any water analyses conducted.

All usable water and prospectively valuable minerals (as described by BLM at onsite) encountered during drilling, will be recorded by depth and adequately protected. All oil and gas shows will be tested to determine commercial potential.

2. Pressure Control Equipment

The BOP and related equipment shall meet the minimum requirements of onshore Oil and Gas Order No. 2 for equipment and testing requirements, procedures, etc., and individual components shall be operable as designed. Chart recorders shall be used for all pressure tests.

Test charts, with individual test results identified, shall be maintained on location while drilling and shall be made available to a BLM representative upon request.

The Vernal District Office shall be notified, at least 24 hours prior to initiating the pressure tests, in order to have a BLM representative on location during pressure testing.

3. Casing Program and Auxiliary Equipment

Surface casing shall have centralizers on the bottom three joints, with a minimum of one centralizer per joint.

The surface casing shall be cemented to surface with a cement that will meet the minimum physical requirements specified API Specification 10 and conform to the minimum requirements of Onshore Oil and Gas Order No. 2.

As a minimum, the usable water and oil shale resources shall be isolated and/or protected by having a cement top for the production casing at least 200 ft. above the top of the Mahogany oil shale, identified at ± 1,450 ft.

The Vernal District Office shall be notified at least 24 hours prior to the running and cementing of all casing strings, in order to have a BLM representative on location while running and cementing all casing strings.

4. Mud Program and Circulating Medium

Hazardous substances specifically listed by the EPA as a hazardous waste or demonstrating a characteristic of a hazardous waste will not be used in drilling, testing, or completion operations.

No chromate additives will be used in the mud system on Federal and Indian lands without prior BLM approval to ensure adequate protection of fresh water aquifers.

5. Coring, Logging and Testing Program

Daily drilling and completion progress reports shall be submitted to this office on a weekly basis.

All Drill Stem tests (DST) shall be accomplished during daylight hours, unless specific approval to start during other hours is obtained from the AO. However, DSTs may be allowed to continue at night if the test was initiated during daylight hours and the rate of flow is stabilized and if adequate lighting is available (i.e., lighting which is adequate for visibility and vaporproof for safe operations). Packers can be released, but tripping should not begin before daylight unless prior approval is obtained from the AO.

A cement bond log (CBL) shall be utilized to determine the top of cement (TOC) and bond quality for the production casing.

6. Notifications of Operations

No location will be constructed or moved, no well will be plugged, and no drilling or workover equipment will be removed from a well to be placed in a suspended status without prior approval of the AO. If operations are to be suspended, prior approval of the AO will be obtained and notification given before resumption of operations.

Operator shall report production data to MMS pursuant to 30 CFR 216.5 using form MMS/3160.

The date on which production is commenced or resumed will be construed for oil wells as the date on which liquid hydrocarbons are first sold or shipped from a temporary storage facility, such as a test tank, and for which a run ticket is required to be generated or, the date on which liquid hydrocarbons are first produced into a permanent storage facility, whichever first occurs; and, for gas wells as the date on which associated liquid hydrocarbons are first sold or shipped from a temporary storage facility, such as a test tank, and for which a run ticket is required to be generated or, the date on which gas is first measured through permanent metering facilities, whichever first occurs.

Gas produced from this well may not be vented or flared beyond an initial authorized test period of 30 days or 50 MMCF following its completion, whichever occurs first, without the prior written approval of the Authorized Officer. Should gas be vented or flared without approval beyond the authorized test period, the operator may be directed to shut-in the well until the gas can be captured or approval to continue venting or flaring as uneconomic is granted and the operator shall be required to compensate the

lessor for that portion of the gas vented or flared without approval which is determined to have been avoidably lost.

7. Other Information

Gas meter runs for each well will be located within 500 feet of the wellhead. The gas flowline will be buried or anchored down from the wellhead to the meter and 500 feet downstream of the meter run or any production facilities. Meter runs will be housed and/or fenced.

The use of materials under BLM jurisdiction will conform to 43 CFR 3610.2-3.

Section 102(b)(3) of the Federal Oil and Gas Royalty Management Act of 1982, as implemented by the applicable provisions of the operating regulations at Title 43 CFR 3162.4-1(c), requires that "not later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in the case of a well which has been off production for more than 90 days, the operator shall notify the authorized officer by letter or sundry notice, Form 3160-5, or orally to be followed by a letter or sundry notice, of the date on which such production has begun or resumed."

If you fail to comply with this requirement in the manner and time allowed, you shall be liable for a civil penalty of up to \$10,000 per violation for each day such violation continues, not to exceed a maximum of 20 days. See Section 109(c)(3) of the Federal Oil and Gas Royalty Management Act of 1982 and the implementing regulations at Title 43 CFR 3162.4-1(b)(5)(ii).

APD approval is valid for a period of one (1) year from the signature date. An extension period may be granted, if requested, prior to the expiration of the original approval period.

In the event after-hours approvals are necessary, please contact one of the following individuals:

Gerald E. Kenczka (801) 781-1190
Petroleum Engineer

Ed Forsman (801) 789-7077
Petroleum Engineer

BLM FAX Machine (801) 789-3634

Contact for Surface Approval
Ashley National Forest (801) 738-2482
Duchesne Ranger District
Joseph R. Bistrzyski

EPA'S LIST OF NONEXEMPT EXPLORATION AND PRODUCTION WASTES

While the following wastes are nonexempt, they are not necessarily hazardous.

Unused fracturing fluids or acids

Gas plant cooling tower cleaning wastes

Painting wastes

Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids

Vacuum truck and drum rinsate from trucks and drums, transporting or containing nonexempt waste

Refinery wastes

Liquid and solid wastes generated by crude oil and tank bottom reclaimers

Used equipment lubrication oils

Waste compressor oil, filters, and blowdown

Used hydraulic fluids

Waste solvents

Waste in transportation pipeline-related pits

Caustic or acid cleaners

Boiler cleaning wastes

Boiler refractory bricks

Incinerator ash

Laboratory wastes

Sanitary wastes

Pesticide wastes

Radioactive tracer wastes

Drums, insulation and miscellaneous solids.

B. SURFACE USE PROGRAM

1. Planned Access Roads

The access road will have a 14 foot running surface maximum.

Access road construction and maintenance will conform to U.S. Forest Service standards outlined in Attachment 1.

2. Location of Existing and/or Proposed Facilities

Tank batteries will be placed in the southeast corner of the well pad. Any change for modification from this plan will be filed for approval in the form of a written sundry notice.

All above-ground facilities will be painted earthtone color (Munsell Soil Color 5Y 6/3) Sand Beige within six months of the well completion.

3. Location and Type of Water Supply

Global Natural Resources Corp. will lay a surface hose from Timber Canyon Creek in the NW/4NW/4 of Section 21, T5S, R9W to the surface location. The water will be pumped to the location for usage. Approximately 10,000 barrels of water will be needed, and it is the intention of the Operator to negotiate, and pay in advance, a depletion fee to the Utah State Division of Fish & Game prior to obtaining usage. The operator will also obtain a permit from the Utah State Water Engineer for approval of usage prior to activities beginning.

Global Natural Resources Corp. shall contact U.S. Fish and Wildlife Service to determine the process for paying the depletion fee and the fee shall be paid in full prior to removing any water from Timber Canyon Creek.

If water for drilling is pumped from the creek, a small mesh screen will be placed over the intake of the pipe and rocks piled around the intake. The operator must check with the State concerning water rights and approval to use the creek as a water source.

4. Source of Construction Materials

Excess dirt from the pad site will be used as infill. All other sources for construction of surface materials, including gravel, will be purchased from private sources and will be hauled into the location. Bids will be taken prior to construction, and the BLM will be notified, by way of sundry notice, of exact materials used and name of contractors prior to construction.

5. Methods for Handling Waste Disposal

A reserve pit liner will be required. The liner will have a burst strength of not less than 140 psi. If the reserve pit is excavated through sand, fractured rock or gravel, the liner will have a burst strength of not less than 200 psi. The drill site will be constructed so all surface runoff from the site drains into the reserve pit. No trash will be disposed of in the reserve pit.

6. Well Site Layout

Rock or structures will be placed in the re-routed drainage to reduce water velocity and potential erosion.

The channel capacity of the rerouted drainage should duplicate or exceed the existing channel. Some meanders should be added along with rock in the bottom of the new channel. The objective is to reduce velocities of the water thereby reducing sediment load to Timber Canyon Creek.

A drainage ditch will be cut between the well pad and existing road to catch runoff from the side of the well pad.

7. Surface Ownership:

Federal, managed by U.S. Forest Service. Mineral is Federal, managed by BLM.

8. Additional Surface Stipulations

Construction and drilling activities can only occur during the period from June to December.

SELF CERTIFICATION STATEMENT

Under the Federal regulations in effect as of June 15, 1988, designation of operator forms are no longer required when operator is not 100% record title holder. An operator is now required to submit a self-certification statement to the appropriate Bureau office stating that said operator has the right to operate upon the leasehold premises.

Please be advised that Global Natural Resources Corporation of Nevada is considered to be the Operator of Well No. GNR #17-1 Timber Canyon; SE/4SE/4 of Section 17, Township 5 South, Range 9 West, U.S.B. & M., Lease U-48776, Wasatch & Duchesne Counties, Utah; and is responsible under the terms and conditions of the lease for the operations conducted upon the leased lands. Bond coverage is provided by Underwriter's Indemnity under Nationwide BLM Bond #B10611.

Date: November 20, 1991

By: Kendal Kuiper
Kendal Kuiper
Land Manager
Global Natural Resources Corporation of Nevada

T5S, R9W, U.S.B. & M.

Stone in Center of Pile of Stones, No Visible Marks

Set, Marked Stone

Sec. 5
Sec. 8

Sec. 4
Sec. 9

5282.705' (Meas.)

5282.705' (Meas.)

17

TIMBER CANYON UNIT #17-1
Elev. Ungraded Ground - 7689'

1095' (COMP.)

N89°40'W - 80.20 (G.L.O.)

NORTH - G.L.O. (Basis of Bearings)
15,848.12' - (Measured)

109' (COMP.)

5282.705' (Meas.)

Sec. 20
Sec. 29

Sec. 21
Sec. 28

Set, Marked Stone

NOTE:
WELL LOCATION BEARS
N0°59'42"W - 6289.1'
FROM THE SOUTHEAST
CORNER OF SECTION 20.

▲ = SECTION CORNERS LOCATED.

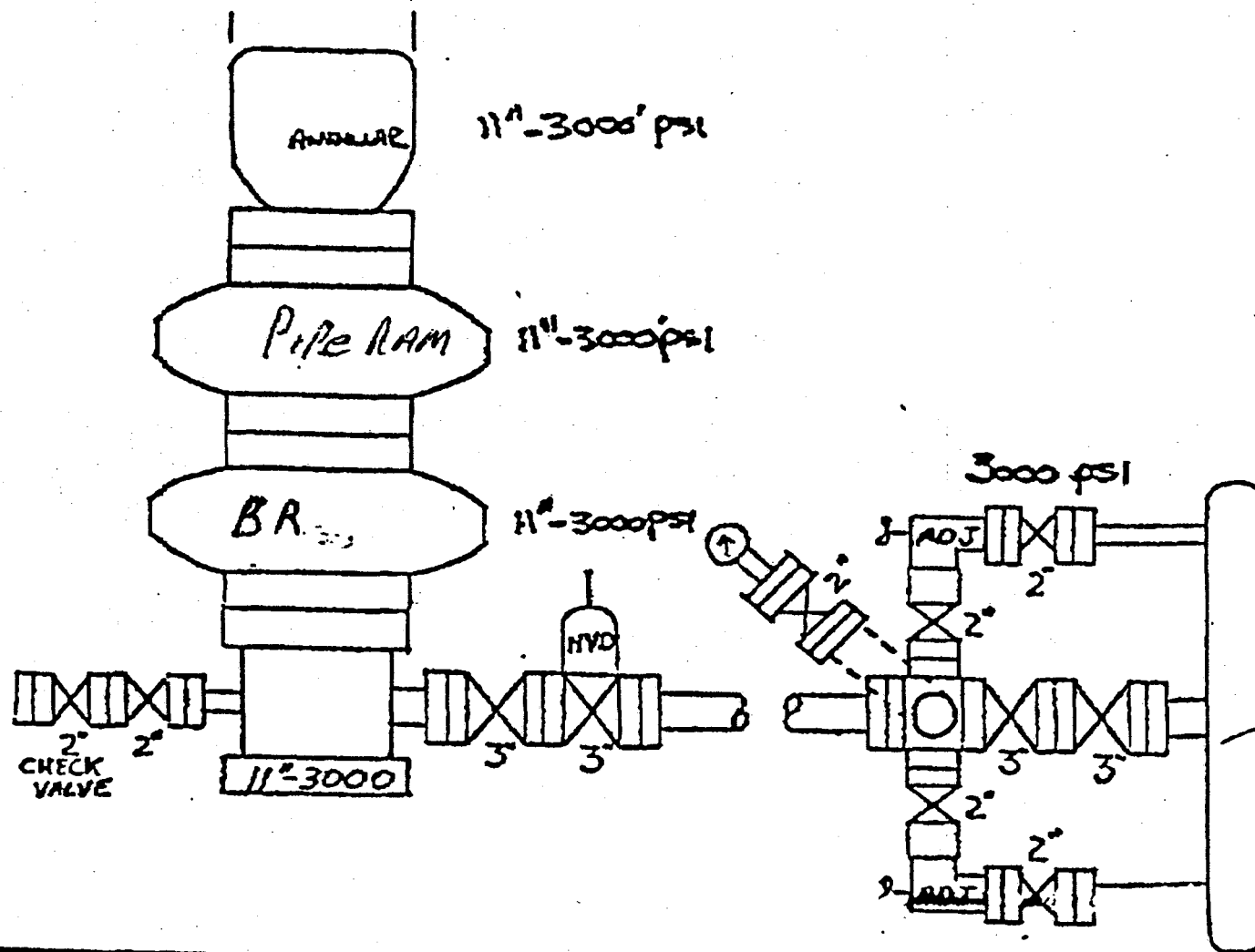
SCALE 1" = 1000'	DATE 6-21-91
PARTY R.K. J.F. R.E.H.	REFERENCES G.L.O. PLAT
WEATHER HOT	FILE GLOBAL NATURAL RESOURCES CORP. OF NEVADA

BOTTOM HOLE PRESSURE DIAGRAM

GLOBAL NATURAL RESOURCES CORPORATION OF NEVADA

Timber Canyon #17-1

Sec. 17: SE/4SE/4, T.5S., R.9W., USB&M



TITLE

BOP STACK ARRANGEMENT

SCALE NAME

BUREAU OF LAND MANAGEMENT
VERNAL DISTRICT

CONDITIONS OF APPROVAL FOR PERMIT TO DRILL

Company: Global Natural Resources Corporation of Nevada

Well No.: Timber Canyon #17-1

Location: Sec 17: SE/4SE/4 T. 5 South, R. 9 West, U.S.B. & M. Lease: U-48776

Onsite Inspection date: July 19, 1991

All lease and/or unit operations will be conducted in such a manner that full compliance is made with applicable laws, regulations (43 CFR 3100), Onshore Oil and Gas Order No. 1, and the approved plan of operations. The operator is fully responsible for the actions of his subcontractors. A copy of these conditions will be furnished to the field representative to ensure compliance.

A. DRILLING PROGRAM:

1. Surface formation and Estimated Formation Tops:

Tertiary Sediments	- Surface
Wasatch Marker	- 3,960 feet
Total Depth (Base of Wasatch)	- 6,500 feet

2. Estimated Depth at Which Oil, Gas, Water or other Mineral-Bearing Zones Are Expected to Be Encountered:

	Formation	Depth
Expected Oil Zones:	Wasatch formation	3,960 feet-6,500 feet
	Green River formation	350 feet-3,959 feet
Expected Gas Zones:	Wasatch formation	3,960 feet- 6,500 feet
	Green River formation	350 feet - 3,959 feet
Expected Water Zones:	None	
Expected Mineral Zones:	None	

All fresh water and prospectively valuable minerals (as described by BLM at onsite) encountered during drilling will be recorded by depth, cased and cemented. All oil and gas shows will be tested to determine commercial potential.

3. Pressure Control Equipment:

Bottom Hole Pressures will be checked by pressure method while drilling. A Rotating Head will be used and checked. See the attached Exhibit "A", for a diagram of the equipment which will be used in testing procedures.

BOP systems will be consistent with Onshore Oil and Gas Order #2. Pressure tests will be conducted before drilling out from under all casing strings which are set and cemented in place. Blowout preventer controls will be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned. Preventers will be inspected and operated at least daily to ensure good mechanical working order, and will be recorded on the daily drilling report. The District Office will be notified 1 day in advance when pressure tests are to be conducted.

4. Casing Program and Auxiliary Equipment:

A 12 1/4" hole will be drilled to the depth of 350' with 8 5/8" surface casing being set. Then a 7 7/8" hole will be drilled (open hole) to total depth, and if productive, 5 1/2" production casing will be set to total depth (or to the depth of the zone being completed.) Casing is new. Surface casing will be 24 lb., K55. Production casing will be 15.5 lb., casing grade will be K55. 30 sacks of 5% "B" cement will be used to cover surface casing. Eight Hundred and Twenty (820) sacks of Class G cement, with additives, will be used for production casing. Cement for casing will be determined after review of the Caliper log. The tread type for all casing will be ST&C.

Anticipated cement tops will be reported as to depth, not the expected number of sacks. The District Office will be notified one day in advance when running casing strings and cement.

5. Mud Program and Circulating Medium:

Drill with spud-mud (gel-water) to approximate depth of 350 feet, and fresh gel water from 350 feet to total depth with a water-polymer mix. The anticipated mud weight will be 9 lbs. 6 oz.

6. Coring, Logging and Testing Program:

No cores will be taken. Drill stem tests will be determined when drilling, however, it is anticipated a DST will be run in both the Wasatch and Green River formations. Gamma Log and Sonic and Neutron Density logs will be run. One Gamma Ray Log will be pulled to the surface.

Whether the well is completed as a dry hole or as a producer, a "Well Completion and Recompletion Report and Log" (form 3160-4) will be submitted to the District Office not later than thirty (30) days after completion of the well, in accordance with 43 CFR 3164. Two copies of all logs, core descriptions, core analyses, well test data, geological summaries, sample descriptions, and all other surveys or data obtained and compiled during the drilling, workover, and/or completion operations, will be filed with Form 3160-4.

7. Abnormal Conditions, Bottom Hole Pressures and Potential Hazards:

No abnormal gas pressures or temperatures are expected. Hydrogen Sulfide or other hazardous gases or fluids are not expected in the area. Anticipated Bottom Hole Pressure is approximately 2,000 psi.

8. Anticipated Starting Dates and Notifications of Operations:

The Operator will contact the Vernal Resource Area at Vernal, Utah forty-eight (48) hours prior to beginning any dirt work on this location. Anticipated starting date will be in the spring of 1992.

No location will be construed or moved, no well will be plugged, and drilling or workover equipment will not be removed from a well without prior approval of the District Manager. District Manager will also be notified if a well is placed in a suspended status, and approval will be requested from District Manager before resuming operations.

The spud date will be reported orally to the District Manager within a minimum of twenty-four (24) hours prior to spudding. Written notification in the form of a Sundry Notice (form 3160-5) will be submitted to the District Office within twenty-four hours after spudding. If the spudding occurs on a weekend or holiday, the written report will be submitted on the following regular work day.

In accordance with Onshore Oil and Gas Order No. 1, this well will be reported on Form 9-329, "Monthly Report of Operations", starting with the month in which operations commence and continue each month until drilling is concluded. This report will be filed directly with the Vernal District Office, 170 South 500 East, Vernal, Utah 84078.

9. Immediate Reports:

Spills, blowouts, fires, leaks, accidents, or any other unusual occurrences shall be promptly reported to the District Office in accordance with requirements of NTL-3A.

If a replacement rig is contemplated for completion operations, a "Sundry Notice" (Form 3160-5) to that effect will be filed for prior approval of the District Manager, and all conditions of this approved plan are applicable during all operations conducted with the replacement rig. In emergency situations, verbal approval to bring on a replacement rig will be approved by the District Petroleum Engineer.

Should the well be successfully completed for production, the District Manager will be notified when the well is placed in a producing status. Such notification will be sent by telegram or other written communication, not later than five (5) business days following the date on which the well is placed on production.

A first production conference will be scheduled within fifteen (15) days after receipt of the first production report. The District Office will coordinate the field conference.

No well abandonment operations will be commenced without the prior approval of the District Manager. In the case of newly-drilled dry holes or failures, and in emergency situations, oral approval will be obtained from the District Petroleum Engineer. A "Subsequent Report of Abandonment" (Form 3160-5) will be filed with the District Manager within thirty (30) days following completion of the well for abandonment. This report will indicate where plugs were placed and the current status of surface restoration. Final abandonment will not be approved until the surface reclamation work required by the approved APD or approved abandonment notice has been completed to the satisfaction of the Area manager or his representative, or the appropriate surface managing agency.

Approval to vent/flare gas during initial well evaluation will be obtained from the District Office. This preliminary approval will not exceed 30 days or 50 MMCF gas. Approval to vent/flare beyond this initial test period will require District Office approval pursuant to guidelines in NTL-4A.

Upon completion of approved plugging, a regulation marker will be erected in accordance with 43 CFR 3162.6. The marker will be constructed as follows: _____
The top of the marker will be closed or capped.

The following minimum information will be permanently placed on the marker with a plate, cap or beaded-on with a welding torch: "FED", "Well number", location by 1/4 section, township and range". "Lease number".

Other: _____

THIRTEEN POINT PLAN OF DEVELOPMENT

1. Existing Roads:

- a. Location is 28.5 miles southwest of Duchesne, Utah.
- b. Access will be obtained by traveling 4.5 miles west of Duchesne on State Highway 40, then 14 miles west along county road, then approximately 10 miles southwesterly on county road and forest service maintained road to location.
- c. Improvements and/or maintenance of existing roads will include the widening of several corners and the use of a temporary bridge across the Strawberry River, all construction will be pursuant to the Provisions and Specifications of the Forest Service Conditions of Approval dated July 23, 1991.

2. Planned Access Roads:

- a. The access road will be approximately 50 feet in length from Existing road, and will meet specifications of Forest Service.
- b. Maximum grades will not exceed six percent.
- c. Location (centerline): Centerline has been flagged. The road will be approximately 30 feet wide with 18 feet running surface.
- d. Excess dirt will be piled on west side of road for drainage.
- e. Surface materials will be purchased from a private source, and will be determined after bids are received prior to construction.
- f. An encroachment permit will be obtained from the Duchesne and Wasatch County Road Departments for use of the Timber County road.
- g. Other:

All specifications and provisions of "Construction" numbered 1-10 on attached Forest Service Conditions of Approval dated July 23, 1991, will be met.

Surface disturbance and vehicular travel will be limited to the approved location and access road. Any additional area needed will be approved by the District Manager in advance.

3. Location of Existing Wells:

None on Property or leasehold.

4. Location of Tank Batteries and Production Facilities:

All permanent (onsite for six (6) months or longer) structures constructed or installed (including oil well pump jacks) will be painted a flat, nonreflective, earth tone color to match the standard environmental colors, as determined by the Rocky Mountain Five-District Interagency Committee. All facilities will be painted within six (6) months of installation. Facilities required to comply with the Occupational Safety and Health Act (OSHA) may be excluded. Colors will be Juniper green, unless otherwise requested by the District.

If a tank battery is constructed on this lease, it will be surrounded by a dike of sufficient capacity to contain 1-1/2 times the storage capacity of the largest tank; all load lines and valves will be placed inside the dike surrounding the tank battery.

All site security guidelines identified in 43 CFR 3162.7 regulations and Onshore Oil And Gas order No. 3; Site Security will be adhered to.

All off-lease storage, off-lease measurement, or co-mingling on-lease or off-lease will have prior written approval from the District Manager. All product lines entering and leaving hydrocarbon storage tanks will be effectively sealed.

Gas Measurement will be conducted in accordance with the Onshore Oil and Gas Order No. 5; Gas Measurement and 43 CFR 3162.7-3.

Gas meter runs for each well will be located within five hundred (500) feet of the wellhead. The gas flowline will be buried from the wellhead to the meter along with any other sections occurring on the pad. Meter runs will be housed and/or fenced.

Oil Measurement will be conducted in accordance with Onshore Oil and Gas Order No. 4, Oil Measurement as of the effective date of August 23, 1989 and CFR 3162.7-2.

The oil and gas measurement facilities will be installed on the well location. The oil and gas meters will be calibrated in place prior to any deliveries. Tests for meter accuracy will be conducted monthly for the first three (3) months on new meter installations and at least quarterly thereafter. The District Manager will be provided with a date and time for the initial meter calibration and all future meter-proving schedules. A copy of the meter calibration reports will be submitted to the District Office. All meter measurement facilities will conform with the API standards for liquid hydrocarbons and the AGA standard for natural gas measurement.

5. Location and Type of Water Supply:

All water needed for drilling purposes will be obtained from the Timber Canyon Creek, pursuant to the approval of Water Engineer.

A temporary water use permit for this operation will be obtained from the Utah State Engineer at Price, Utah (801) 637-1303. Water obtained on private land, or land administered by another agency, will require approval from the owner or agency for use of the land.

6. Source of Construction Material:

Pad construction material will be determined and obtained after onsite.
The use of materials under BLM jurisdiction will conform to 43 CFR 3610.

7. Methods of Handling Waste Disposal:

The reserve pit will be lined if deemed necessary at time of drilling.

The reserve pit will be fenced on three non-working sides during drilling. After drilling is completed, the fourth side of the pit will be fenced until the pit is reclaimed.

The entire disturbed location will be fenced after seeding. Fences and cattleguards must meet Forest Service specifications. Once the location has been rehabilitated and vegetation re-established, the fence will be removed or the fenced area reduced as required by the Forest Service.

Production water or testing tanks shall be located and/or diked so that any spilled fluids will flow into the reserve pit. Production water tanks will not be placed on topsoil stockpiles.

No liquid hydrocarbons (i.e. fuels, lubricants, formation) will be discharged to the reserve pit and/or location. No chrome compounds will be on location.

Portable dumpsters or cage will be used for all trash. All trash will be hauled off site, no burning will be allowed.

Sewage will be disposed of according to county and state requirements, and a portable chemical toilet will be used on site.

Produced waste water will be confined to the reserve pit for a period not to exceed ninety (90) days after initial production. During the ninety (90) day period, an application for approval of a permanent disposal method and location, along with the required water analysis, will be submitted for the District Manager's approval pursuant to Onshore Oil and Gas Order No. 3 (NTL-2B).

8. Ancillary Facilities:

Camp facilities will not be required.

9. Well Site Layout:

The reserve pit will be located on the west side of the location.

The top 6 inches of soil material will be removed from the location and stockpiled separately on the north and east side(s) of the site. Topsoil along the access road will be reserved in place adjacent to the road.

Access to the well pad will be from the North, along the planned access road.

The trash basket will be located on the south west corner of the well pad.

10. Plans for Restoration of Surface:

A. Within 48 hours of completion of drilling, the location and surrounding area will be cleared of everything not required for production.

B. As soon as the reserve pit has dried all areas not needed for production (including access road) will be filled in, recontoured to approximately natural contours and (12 inches) replaced leaving sufficient for future restoration. The remaining top soil (if any) will be stabilized and seeded in place. If the well is a dry hole, the location and access road will be rehabilitated in total.

C. Seed mixtures to be used in rehabilitating this site will be provided by the Forest Service. Seeding will be accomplished during the spring or fall seeding period as directed by the Forest Service. (Fall is considered to be best).

SEED MIX TIMBER CANYON DRILL SITE

2	lbs/acre of Fairway Crested wheatgrass (17.4%)
1	lbs/acre of Intermediate wheatgrass (8.6%)
2	lbs/acre of Paiute Orchardgrass (17.4%)
1.5	lbs/acre of Hard Fescue (13.0%)
1.5	lbs/acre of Ladak Alfalfa (13.0%)
1	lbs/acre of Lewis Flax (8.6%)
1	lbs/acre of Rincon Fourwing Saltbush (8.6%)
1.5	lbs/acre of Forage Kochia (13.0%)
<hr/>	
11.5 lbs.	99.6%

The operator will be responsible for control or elimination of any noxious weeds associated with this well site until vegetative cover is re-established.

D. Seed will be broadcast followed by a light harrowing. If the seed is drilled, the seeding rate can be reduced by 25% and harrowing can be eliminated.

Additional Requirements: Other water control measures may be required by authorized officer.

11. Surface and Mineral Ownership: The State of Utah owns all surface and mineral interests.

12. Other Information:

There will be no deviation from the proposed drilling and/or workover program without prior approval from the District Manager. Safe drilling and operating practices must be observed. All wells, whether drilling, producing, suspended, or abandoned, will be identified in accordance with 43 CFR 3162.2.

"Sundry Notice and Report on Wells" (Form 3160-5) will be filed for approval for all changes of plans and other operations in accordance with 43 CFR 3164.

The dirt contractor will be provided with an approved copy of the surface operations in accordance with 43 CFR 3164.

The dirt contractor will be provided with an approved copy of the surface use plan.

All Specifications and Conditions of "Rehabilitation" #22-26 on the attached Forest Service Conditions of Approval dated July 23, 1991, will be met as set forth.

This permit will be valid for a period of one (1) year from the date of approval. After permit termination, a new application will be filed for approval for any future operations.

13. Lessee's or Operator's Representative Certification:

Representative: Mark S. Dolar
9035 South 700 East, Suite 100A
Sandy, Utah 84070-2418

Certification:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which currently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by GLOBAL NATURAL RESOURCES CORPORATION OF NEVADA and its contractors and sub-contractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

Date: _____

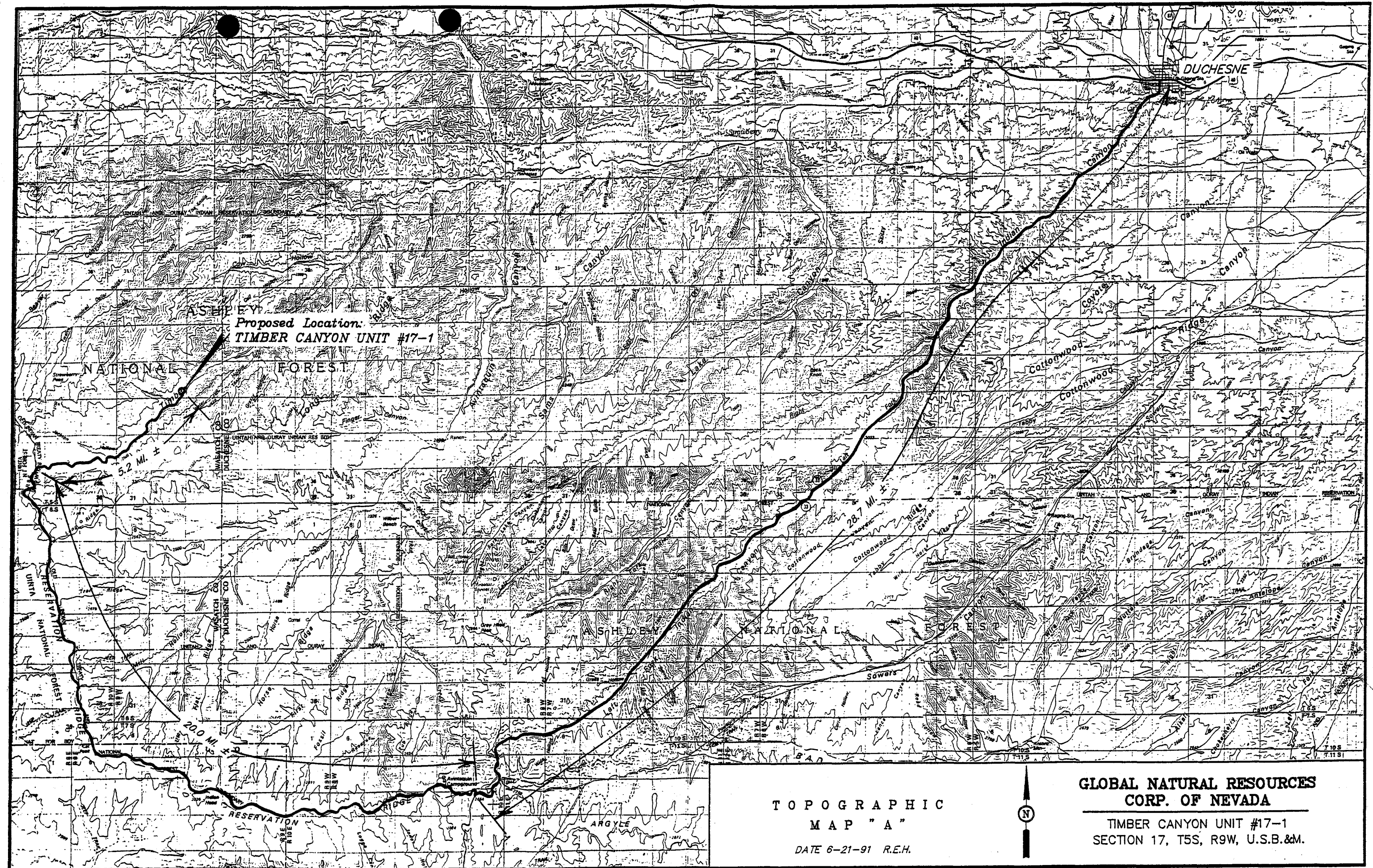
9/19/91

By: _____

Wm. Allan Smith

Wm. Allan Smith
Attorney-In-Fact

K/c

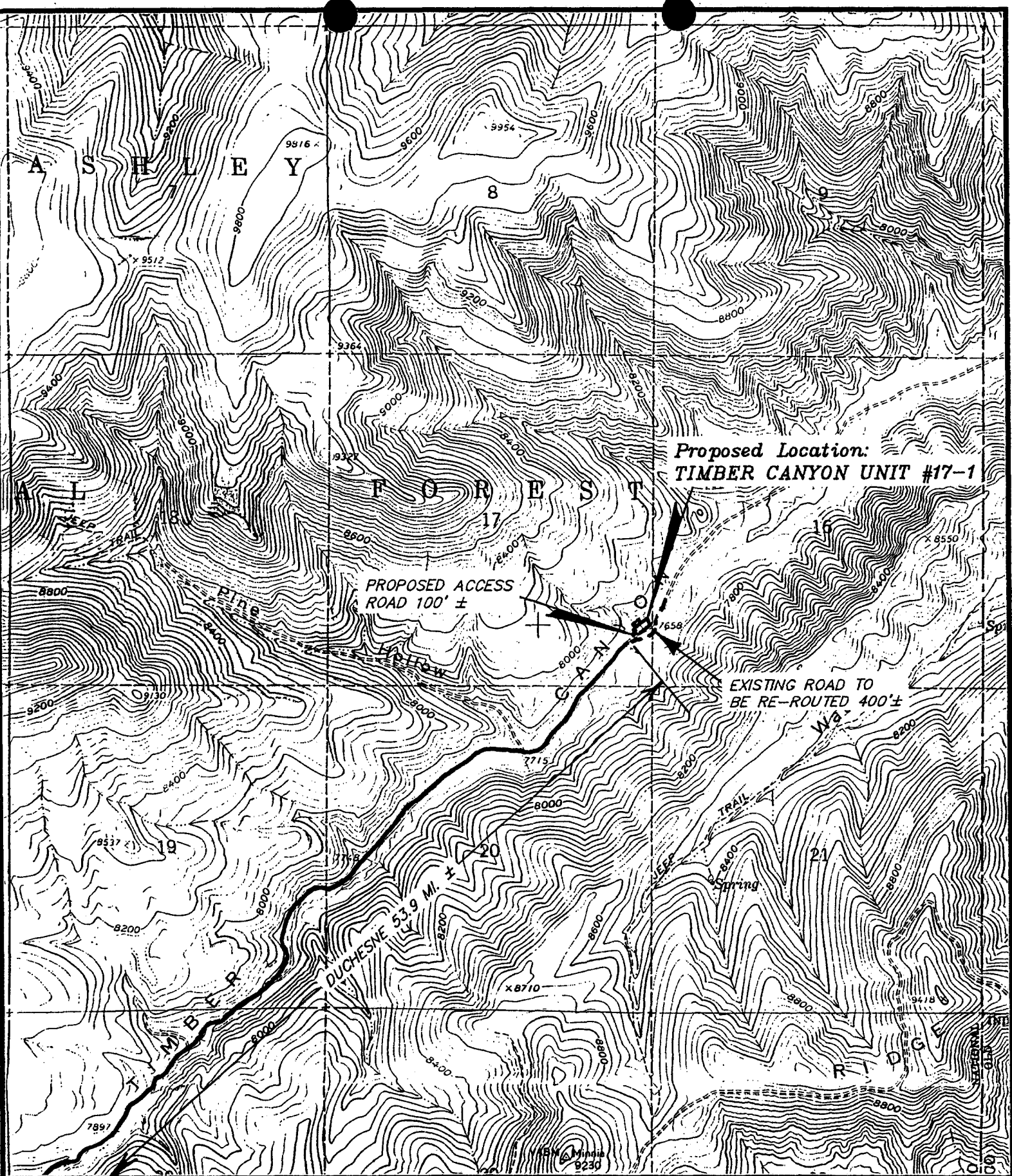


Proposed Location:
TIMBER CANYON UNIT #17-1

TOPOGRAPHIC
MAP "A"
DATE 6-21-91 R.E.H.



GLOBAL NATURAL RESOURCES
CORP. OF NEVADA
TIMBER CANYON UNIT #17-1
SECTION 17, T5S, R9W, U.S.B.&M.



TOPOGRAPHIC

MAP "B"

SCALE: 1" = 2000'

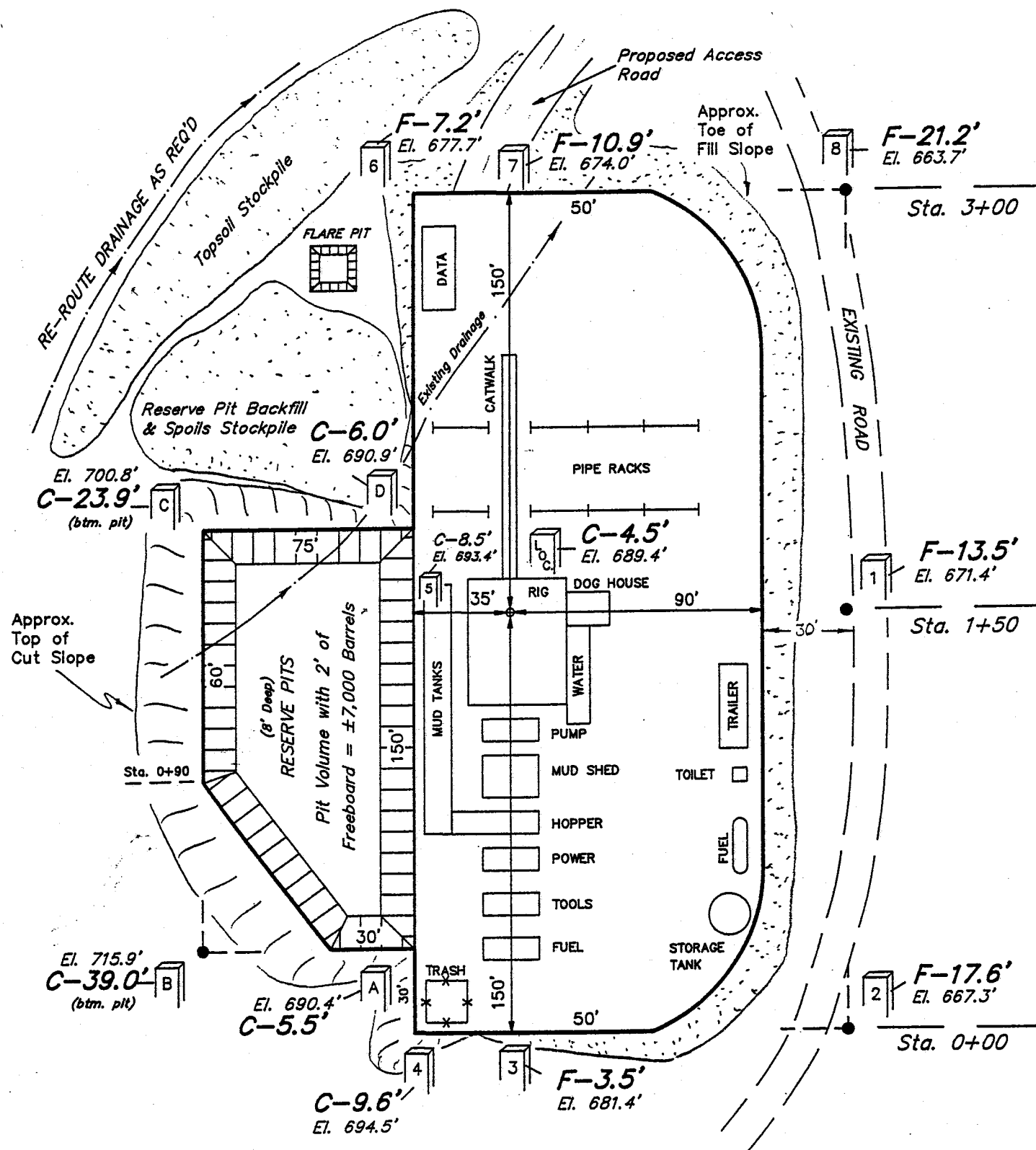
DATE 6-21-91 R.E.H.



GLOBAL NATURAL RESOURCES
CORP. OF NEVADA

TIMBER CANYON UNIT #17-1
SECTION 17, T5S, R9W, U.S.B.&M.

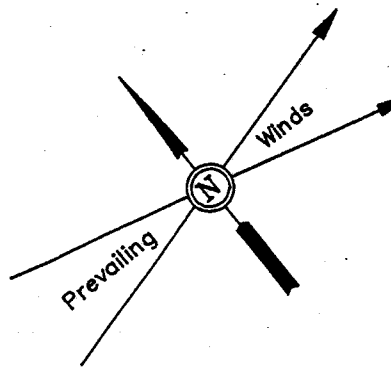
GLOBAL NATURAL RESOURCES
CORP. OF NEVADA
LOCATION LAYOUT FOR
TIMBER CANYON UNIT #17-1
SECTION 17, T5S, R9W, U.S.B.&M.



APPROXIMATE YARDAGES

(6") Topsoil Stripping	= 880 Cu. Yds.
Remaining Location	= 10,650 Cu. Yds.
TOTAL CUT	= 11,530 CU.YDS.
FILL	= 9,150 CU.YDS.

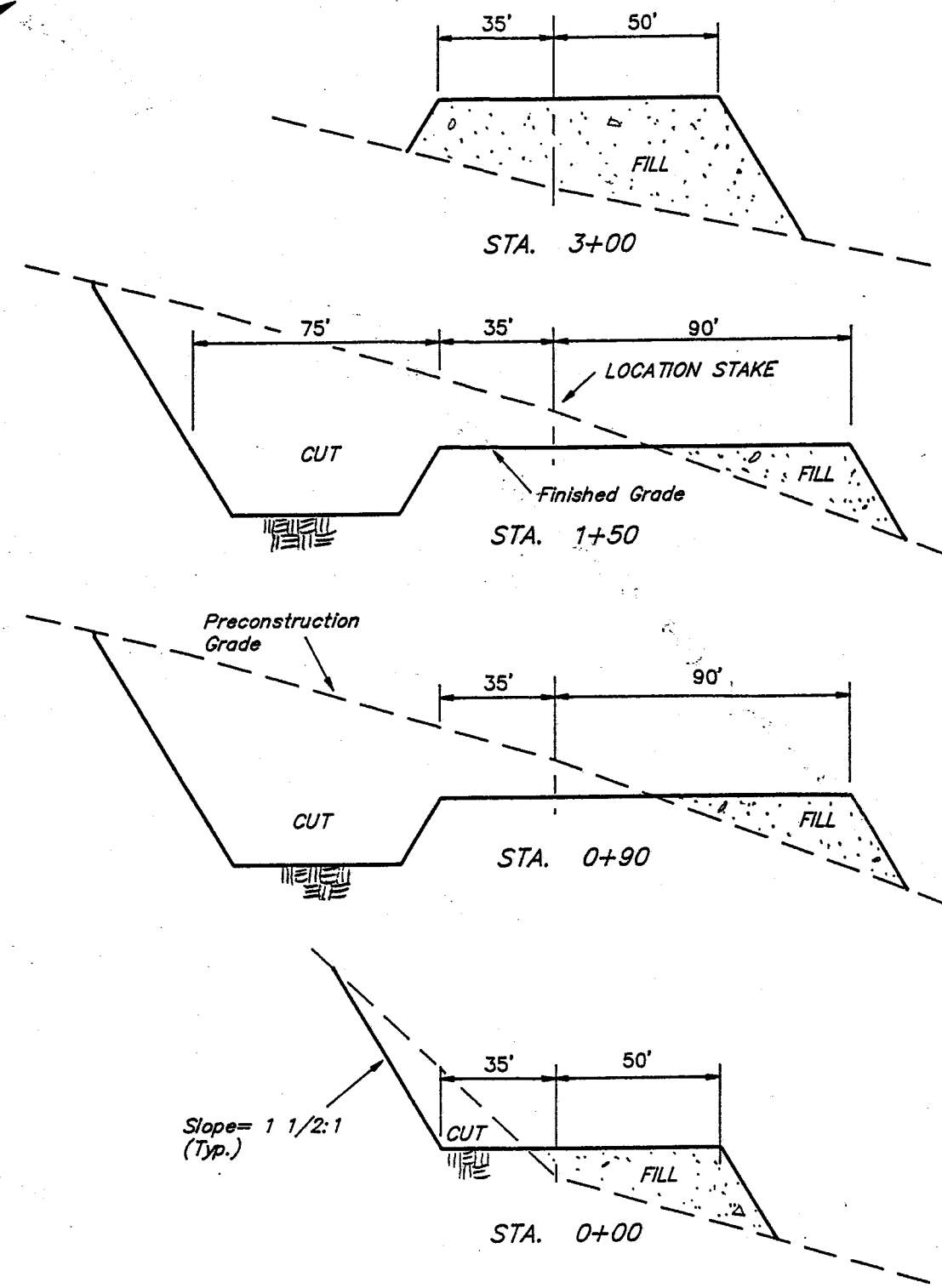
EXCESS MATERIAL AFTER 5% COMPACTION	= 1,900 Cu. Yds.
Topsoil & Pit Backfill (1/2 Pit Vol.)	= 1,890 Cu. Yds.
EXCESS UNBALANCE (After Rehabilitation)	= 10 Cu. Yds.



SCALE: 1" = 50'
DATE: 6-21-91
Drawn By: R.E.H.
Revised: 9-20-91 T.D.H.

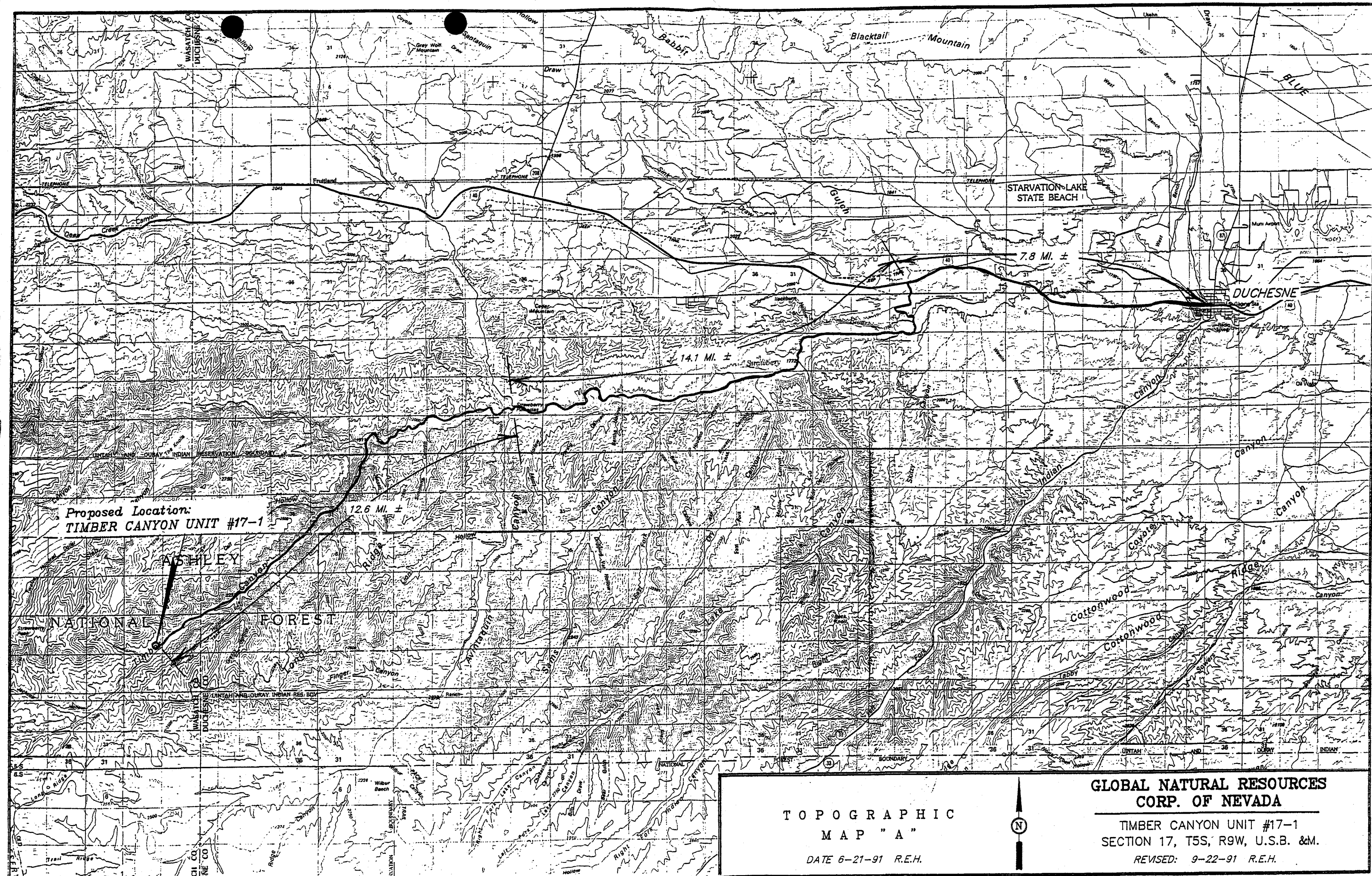
X-Section Scale
1" = 20'
1" = 50'

TYP. LOCATION LAYOUT
TYP. CROSS SECTIONS



Elev. Ungraded Ground at Location Stake = 7689.4'
Elev. Graded Ground at Location Stake = 7684.9'

UINTAH ENGINEERING & LAND SURVEYING
85 So. 200 East Vernal, Utah



Proposed Location:
TIMBER CANYON UNIT #17-1

ASHLEY

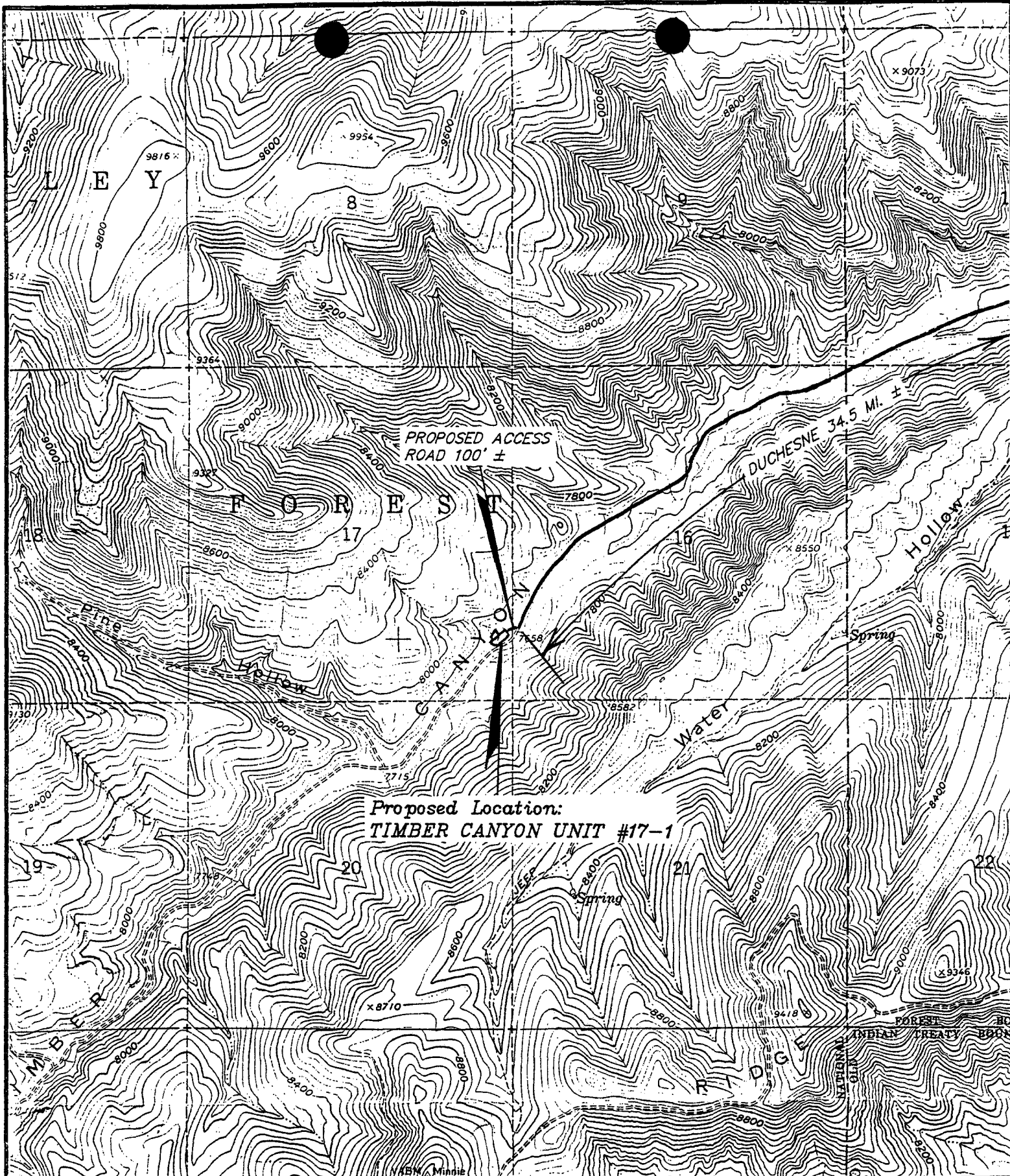
NATIONAL FOREST

GLOBAL NATURAL RESOURCES
CORP. OF NEVADA

TIMBER CANYON UNIT #17-1
SECTION 17, T5S, R9W, U.S.B. &M.
REVISED: 9-22-91 R.E.H.

TOPOGRAPHIC
MAP "A"

DATE 6-21-91 R.E.H.



TOPOGRAPHIC

MAP "B"

SCALE: 1" = 2000'

DATE 6-21-91 R.E.H.

GLOBAL NATURAL RESOURCES
CORP. OF NEVADA

TIMBER CANYON UNIT #17-1
SECTION 17, T5S., R9W, U.S.B. &M.

REVISED: 9-22-91 R.E.H.



ARCHEOLOGICAL - ENVIRONMENTAL RESEARCH CORPORATION

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Tel: (801) 292-7061, 292-9668

July 8, 1991

Subject: CULTURAL RESOURCE EVALUATIONS OF A PROPOSED
WELL LOCATION IN THE TIMBER CANYON LOCALITY OF
WASATCH COUNTY, UTAH

Project: ~~Global Natural Resources Corporation of Nevada~~
Timber Canyon Unit No. 17-1

Project No.: GNRC-91-1

Permit No.: Dept. of Agriculture -- U.S. Forest Service
Special-Use Permit dated 7-5-91

Utah State Project No. Ut-91-AF-302f

To: Global Natural Resources Corporation c/o Mr. Mark Dolar,
Dolar Oil Properties, 9035 South 700 East, Suite 100A,
Sandy, Utah 84070

Mr. Joseph R. Bistryski, District Ranger, Duchesne
Ranger District of the Ashley National Forest, P.O. Box
1, Duchesne, Utah 84021

Info: Antiquities Section, Division of State History, 300 Rio
Grande, Salt Lake City, Utah 84101

GENERAL INFORMATION:

On July 5, 1991, F. Richard Hauck of AERC conducted an intensive cultural resource evaluation of a proposed oil/gas well location situated in the Timber Canyon locality southwest of Duchesne, Utah as shown on the attached map. This project was initiated for Global Natural Resources Corporation of Nevada. The proposed drilling location (Timber Canyon No. 17-1) is located in the Ashley National Forest administered by the Duchesne Ranger District.

The Timber Canyon Unit No. 17-1 proposed well location is in Township 5 South, Range 9 West (situated in the SE 1/4 of the SE 1/4 of Section 17). The proposed well location is adjacent to an existing roadway.

The project area is on the west slope of Timber Canyon. It has been staked on an active alluvial fan deposition slope situated at the base of a narrow side-canyon. The elevation of the location is at 7680 feet above sea level. Existing vegetation in the project area includes Pseudotsuga menziesii and Populus tremuloides on the north-facing slope above the well location and Pinus edulis and Juniperus spp. on the more exposed south-facing slopes above the location. A riparian environment including Salix spp. is situated down-slope and to the southeast of the proposed location. Dominant vegetation species on the well site include Chrysothamnus nauseosus, Artemisia tridentata, and Amelanchier spp. The geology of the area is associated with the middle unit of the Parachute Creek member of the Eocene Period Green River Formation.

FILE SEARCH:

A records search of the site files and maps at the Antiquities Section of the State Historic Preservation Office in Salt Lake City was conducted on July 2, 1991. No known sites are in the immediate vicinity of the proposed drilling location. The National Register of Historic Places has been consulted and no registered historic or prehistoric properties will be affected by the proposed development.

FIELD METHODOLOGY:

This intensive evaluation of the proposed disturbance zone was accomplished by walking a series of 10 to 15 meter wide transects within the proposed development area including the surfaces southeastward down to the creek bank.

RESULTS:

No historic or prehistoric cultural activity loci were observed or recorded during the archaeological evaluations. Since

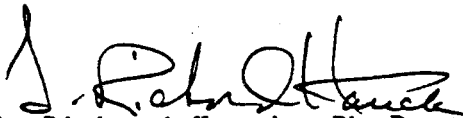
the location has been staked in an active alluvial deposition zone, there is a very low probability for finding significant or isolated prehistoric cultural resources in-situ on the surface. A limited possibility exists that buried cultural features may be situated within the project area, particularly in the vicinity of the creek bank. Stipulations provided below address this factor. AERC does not recommend a cultural resource monitoring during the subsurface construction activities on the staked well location which appears to have its southeastern periphery ca. 30 meters to the northwest and above the present creek-bed.

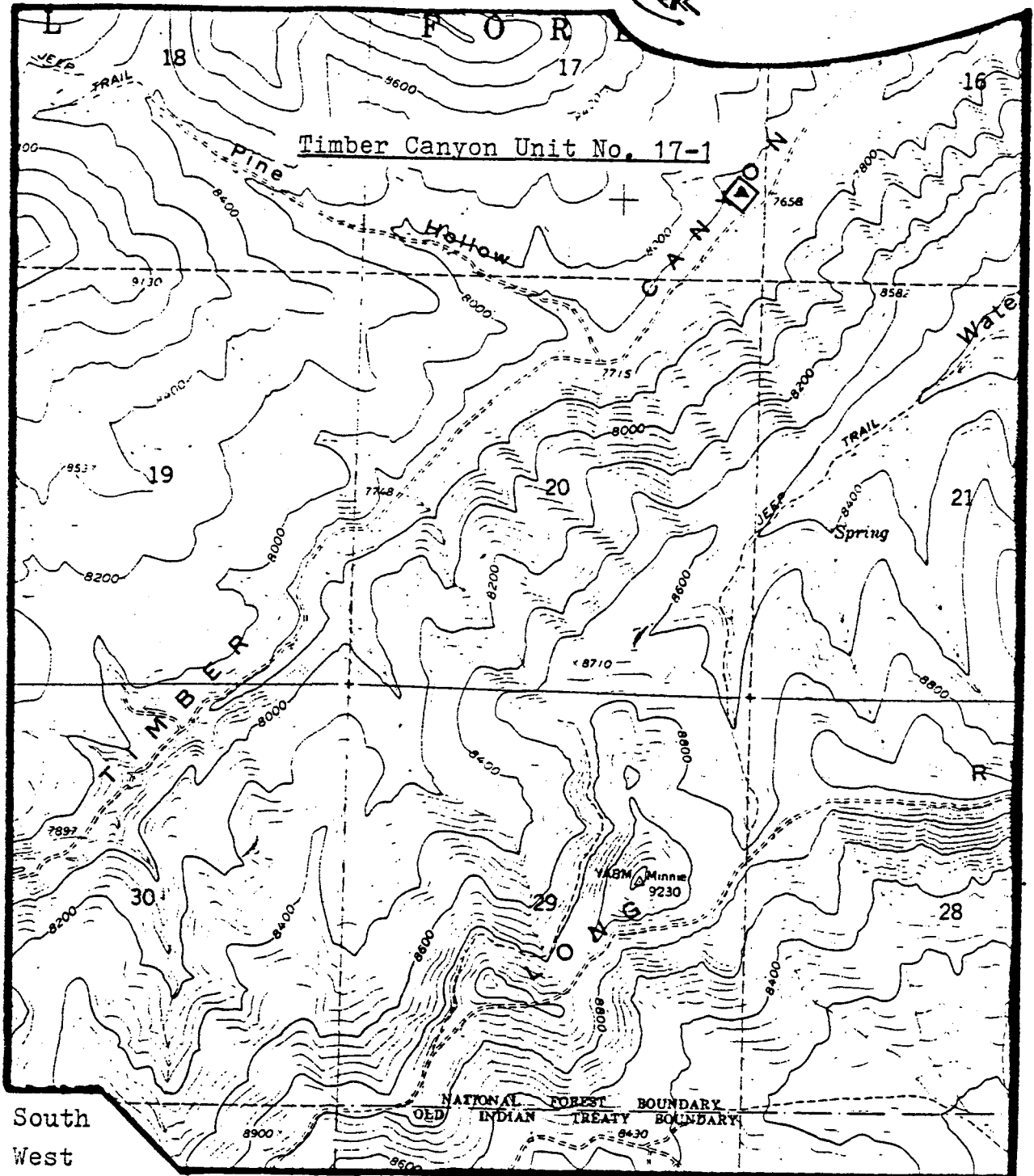
No isolated artifacts were identified during the evaluation and no artifacts were collected per the requirements of the Special-Use Permit.

CONCLUSION AND RECOMMENDATIONS:

AERC recommends that a cultural resource clearance be granted to Global Natural Resources Corporation of Nevada relative to this project based upon adherence to the following stipulations:

1. All vehicular traffic, personnel movement, and operations should be confined to the location examined as referenced in this report, and to the existing roadways;
2. all personnel should refrain from collecting artifacts and from disturbing any cultural resources in the area; and
3. the authorized official should be consulted should cultural remains from subsurface deposits be exposed during the various project operations or if the need arises to relocate or otherwise alter the location of the drilling/construction activity.


F. Richard Hauck, Ph.D.
President and Principal
Investigator



T. 5 South

R. 9 West

Meridian: Uinta B. & M.

Quad:

Strawberry Peak,
Utah
7.5 minute-USGS

Project: GNRC-91-1

Series: Uinta Basin

Date: 7-8-91

Cultural Resource Survey
of Proposed Timber Canyon
Unit No. 17-1 in Wasatch
County, Utah

Legend:

Well Location &
Survey Area



2.64" = 1 mile

Scale

Section 101 - Abbreviations

101.01
Organizations &
Standards

Whenever in these specifications, or in other contract documents, the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as follows. Reference to a specific standard or specification shall mean the latest edition or amendment in effect on date of invitation to bid.

AASHTO--American Association of State Highway and Transportation Officials

ACI--American Concrete Institute

AISC--American Institute of Steel Construction

AISI--American Iron and Steel Institute

AITC--American Institute of Timber Construction

ANSI--American National Standards Institute

APA--American Plywood Association

API--American Petroleum Institute

ASME--American Society of Mechanical Engineers

ASTM--American Society for Testing and Material

ATCC--American Type Culture Collection

AWPA--American Wood Preservers Association

AWPB--American Wood Preservers Bureau

AWS--American Welding Society

AWWA--American Water Works Association

CFR--Code of Federal Regulations

CRSI--Concrete Reinforcing Steel Institute

CS--Commercial Standard issued by U.S. Department of Commerce

DEMA--Diesel Engine Manufacturers Association

FAR--Federal Acquisition Regulation

FED SPEC. or FS--Federal Specifications

FSS--Federal Specifications and Standards

GSA--General Services Administration

MIL--Military Specifications

MSHA--Mine Safety and Health Administration

MUTCD--Manual on Uniform Traffic Control Devices

NBFU--National Board of Fire Underwriters

NBS--National Bureau of Standards

NEMA--National Electrical Manufacturers Association

NESC--National Electrical Safety Code

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.01

NFPA--(Fire)--National Fire Protection Association
 NFPA--(Forest)--National Forest Products Association
 NWMA--National Woodwork Manufacturers Association
 OSHA--Occupational Safety and Health Administration
 PCA--Portland Cement Association
 PCI--Prestressed Concrete Institute
 PS--Product Standard issued by the U.S. Department of Commerce
 PTI--Post-Tensioning Institute
 RIS--Redwood Inspection Service
 SAE--Society of Automotive Engineers
 SF--Standard Form
 SSPC--Steel Structures Painting Council
 UL--Underwriter's Laboratories, Inc.
 USASI--United States of America Standards Institute
 WCLIB--West Coast Lumber Inspection Bureau
 WWPAA--Western Wood Products Association

101.02
 Pay Items
 & Pay Units

ABBREVIATIONS

Aluminum	AL.
Asphalt	ASP.
Barbed Wire	B.W.
Bituminous Coated Corrugated Steel Pipe	B.C.C.S.P. OR B.C.C.S. PIPE
Cement	CEMT.
Cement Treated	CEMT.-T.
Cement Treated Base	CTB
Clearing & Grubbing	CLEAR & GRUB
Compaction	CMPCT.
Concrete	CONC.
Corrugated Metal Pipe	CMP
Corrugated Steel Pipe	C.S.P.
Corrugated Steel Pipe Arch	C.S.P. ARCH
Cubic Yard	C.Y.
Cubic Yard Mile	C.Y.MI.
Diameter	DIA.
Each	EA.
Emulsified	EMLSPD.
Erosion and Pollution Control	E&P CONTROL
Fabricated	FABR.
Foundation	FOUND.
Furnished	FURN.
Gallon	GAL.
Grade	GR.
Height	HT.
High Strength	H. STRENGTH
Horizontal	HOR.
Hour	HR.
Linear Foot	L.F.
Liquid	LIQ.
Loading	LD.
Lump Sum	L.S.
Material	MAT'L
Maximum	MAX.
Method	M.

Mile	MI.
Minimum	MIN.
One Thousand Feet Board Measure	MFBM
One Thousand Gallons	M.GALS.
One Thousand Gallons Mile	M.GALS.MI.
One Thousand Square Feet	M.S.F.
Polyvinylchloride	PVC
Pounds	LBS.
Reflectorized	REFLECT.
Section	SEC.
Square Foot	S.F.
Square Yard	S.Y.
Station	STA.
Station Yard	STA. YD.
Strand	S.
Structural	STRUCT.
Structural Steel	S. STEEL
Stump	STMP
Target Value	TV
Thickness	TH.
Ton Mile	T.M.
Tops and Limbs	T&L
Utilization of Timber	UOT
Vertical	VERT.
White	WH.
Width	W.
With	W/
Without	W/O
Woven wire	W.W.
Yellow	YE.

101
.02

Section 102 - Definitions

102

Wherever in these specifications, or in other contract documents, the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as follows:

Adjustment in Contract Price. "Adjustment in contract price" shall mean "equitable adjustment" as used in the Federal Acquisition Regulations, or "Construction Cost Adjustment" as used in the Timber Sale Contract as applicable.

Arch Pipe. A culvert section, usually formed of bolted structural plates, that is an arc of a circle (usually one-half or less); that is, a bottomless culvert.

Base Course. The layer or layers of specified or selected material of designed thickness placed on a subbase or subgrade to support a surface course. (See figure 102-1.)

Bearings. The portion of a beam, girder, or truss that transmits the bridge superstructure load to the substructure.

Berm. Curb or dike constructed to control roadway runoff water. (See figure 102-1.)

Bridge. A structure, including supports, erected over a depression or an obstruction, such as water, road, trail, or railway, and having a floor for carrying traffic or other moving loads.

Bridge Length. The overall length measured along the centerline of road to the back of abutment backwalls, if present; otherwise, end to end of the bridge floor, but in no case less than the total clear opening of the structure.

Bridge Traveled Way Width. The clear width measured at right angles to the longitudinal centerline of the bridge between the bottom of curbs or, if curbs are not used, between the inner faces of parapet or railing.

Change. "Change" means "Change Order" as used in the Federal Acquisition Regulations, or "Design Change" as used in the Timber Sale Contract.

Clearing Limits. The limits of clearing as designated on the ground or on the drawings. (See figure 102-1.)

Conduit. A natural or artificial channel for carrying fluids, as water pipes, canals, and aqueducts.

Construction Slash. All vegetative material not meeting utilization standards, such as tops and limbs, timber, brush, and grubbed stumps associated with construction or reconstruction of a facility.

Contracting Officer (CO). The person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings.

Contractor. The individual, partnership, joint venture, or corporation undertaking the execution of the work under the terms of the contract and acting directly or through their agent, employees, or subcontractors. As used in specifications and drawings for specified roads (Timber Sale Contracts), "contractor" is "purchaser."

Controlled Felling. Directing the placement of trees in felling by wedges, jacks, cable tension, or distribution of holding wood or any combinations of these which will ensure that trees are dropped into previously cleared areas, or clear of any objects that are to remain.

Culvert. A conduit or passageway under a road, trail, or other obstruction. A culvert differs from a bridge in that it is usually constructed entirely below the elevation of the traveled way.

Cushion Material. Native or imported material generally placed over rocky sections of unsurfaced roads to provide a usable and maintainable traveled way.

Defect. A failure to meet a requirement with respect to a single quality characteristic.

Drawings. The documents, including plan and profile sheets, cross sections, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials showing details for construction of a facility.

Embankment. A structure of soil, aggregate, or rock material placed on the prepared ground surface and constructed to subgrade.

Engineer. The Contracting Officer's Representative (COR) or Engineering Representative (ER) responsible for onsite administration of the contract.

Equipment. All machinery and equipment, together with the necessary supplies for upkeep and maintenance, as well as tools and apparatus necessary for the proper construction and acceptable completion of the work.

Excess Excavation. Material from the roadway in excess of that needed for construction of designed roadways.

Forest Service. The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Gauge. The term "gauge" when used in connection with the measurement of plates will mean the U.S. Standard Gauge, except when reference is made to the measurement of metal sheets used in the manufacture of corrugated metal, pipe, metal plate culverts and arches, and metal cribbing, then the term means the "gauge" or "thickness" specified in AASHTO M 36, M 167, M 196, and M 219, as applicable. When the term "gauge" refers to the measurement of wire, it will mean the wire gauge specified in AASHTO M 32.

Government Land. National Forest System lands, and other lands controlled or administered by the Forest Service or by other Federal agencies.

Inspector. The Government-authorized representative designated in writing by the CO, COR, or ER responsible for detailed inspection.

Job-Mix Formula. The percentage of each material in a mixture intended for a particular use.

Laboratory. A testing laboratory of the Government or any other testing laboratory approved by the Contracting Officer.

Materials. Any substance specified for use in the construction of the project and its appurtenances.

Maximum Density. The highest density that can be obtained under stated conditions.

Measurement. Determining and expressing the quantities of work or materials.

Multi-Beam Girder. A precast, prestressed concrete member where the concrete deck is precast as an integral part of the member.

Neat Line. A line defining the proposed or specified limits of an excavation or structure.

Nominal Dimensions or Weights. The numerical values shown on the drawings or in the specifications as measurements of material to be used in the construction.

Nominal Maximum Particle Size. The largest sieve size listed in the applicable specification upon which any material is permitted to be retained.

Overbreak. Material beyond the neat line of an excavation that is removed in the process of excavation, usually by blasting.

Pavement Structure. Subbase, base, or surface course, or combination thereof, placed on a subgrade to support the traffic load and distribute it to the roadbed.

Pioneer Road. Temporary construction access built along the route of the project.

Pipe. A culvert that is circular (round) in cross-section.

Pipe-Arch. A pipe that has been factory-deformed from a circular shape such that the width (or span) is larger than the vertical dimension (or rise).

Profile Grade. The trace of a vertical plane, as shown on the drawings, intersecting the top surface at the centerline of the proposed facility construction.

Purchaser. The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through his, their, or its agents, employees, or subcontractors.

Random Sampling. Sampling at times or locations determined in advance by the use of a table of random numbers.

Reasonably Close Conformity. Unless working tolerances are specified, all work performed and materials furnished shall be in reasonably close conformity with lines, grades, cross sections, dimensions, and material requirements shown on the drawings, indicated in the specifications, or designated on the ground. "Reasonably close conformity" is compliance with reasonable and customary manufacturing and construction tolerances.

Right-of-Way. A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands) or (2) land, appurtenances thereto, or interest therein, usually in a strip, acquired for public or private passageway. (See figure 102-1.)

Road Template. The shape and cross-sectional dimensions of the roadway to be constructed as defined by the construction staking notes and the characteristics of the typical sections.

Roadbed. The graded portion of a road between the intersection of subgrade and side slopes excluding that portion of the ditch below subgrade. (See figure 102-1.)

Roadside. A general term denoting the area adjoining the outer edge of the roadway. (See figure 102-1.)

Roadway. The portion of the road within the limits of excavation and embankment, including slope rounding. (See figure 102-1.)

Schedule of Items. A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, methods of measurement, unit price, and amount.

Second Samples. A sample taken when the initial sample indicates that the material is defective.

102

Shoulder. The portion of the roadway contiguous to the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of pavement structure. (See figure 102-1.)

Sidewalk. The portion of the roadway constructed primarily for pedestrian use.

Special Project Specifications. The specifications that detail the conditions and requirements peculiar to the individual project, including additions and revisions to Standard Specifications.

Specifications. A description of the technical requirements for a material, product, or service that includes criteria for determination whether these requirements are met.

Standard Specifications. Specifications approved for general application and repetitive use.

Subbase. The layers of specified or selected material of designed thickness placed on a subgrade to support a base course.

Subgrade Treatment. Modification of roadbed material by stabilization.

Subgrade. The layers of roadbed that bring it up to the top surface, upon which subbase, base, or surface course is constructed. For roads without base course or surface course, that portion of roadbed prepared as the finished wearing surface. (See figure 102-1.)

Substructure (Bridge). All of that part of the structure below the bearings of simple and continuous spans, skewbacks of arches, and tops of footings of rigid frames, together with the backwalls, wingwalls, and wing protection railings.

Superstructure (Bridge). The entire structure except the substructure.

Surface Course. The top layer of a pavement structure, sometimes called the wearing course, usually designed to resist skidding, traffic abrasion, and the disintegrating effects of climate. (See figure 102-1.)

Tackifier. Binder for vegetative mulch.

Target Value. The percentage of each material in a mixture intended for a particular use from which allowable variations are measured.

Timber Sale Contract. A written contract for the removal of National Forest timber.

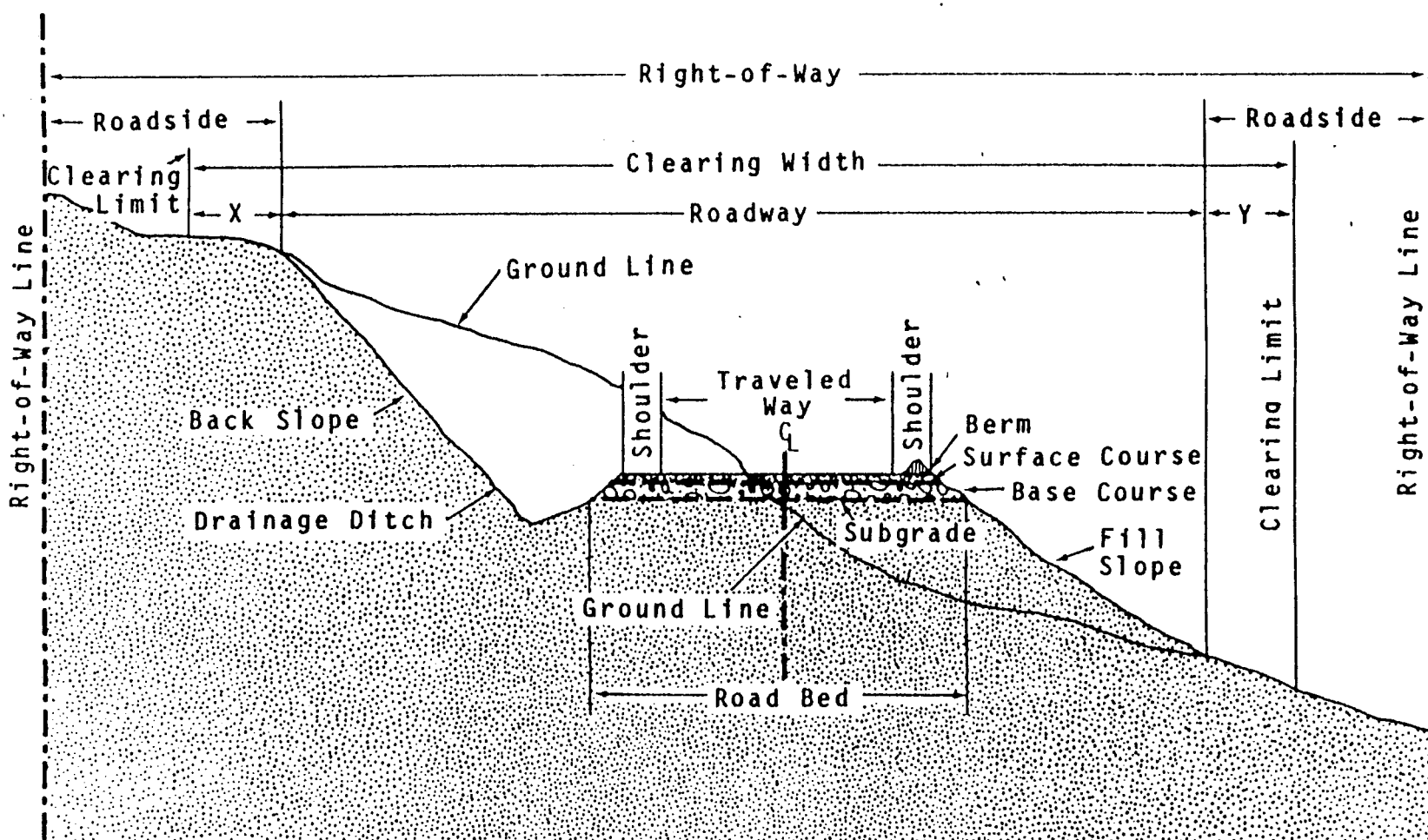
Traveled Way. The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes. (See figure 102-1.)

Turnout. A short auxiliary lane on a one-lane road provided for the passage of meeting vehicles.

Unit of Measurement. The unit and fractions of units shown in the Schedule of Items.

Unsuitable Material. The material excavated during roadway construction that is not usable in embankment and must be disposed of or that can be used only in certain locations or for limited purposes.

Utilization Standards. The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.



Note: Shapes and dimensions will vary to fit local conditions.
See drawings for typical sections.
X and Y denote clearing outside of roadway.

Figure 102-1.--Illustration of road structure terms.

Section 103 - Intent of Contract

The intent of the contract is to provide for the complete construction of the project described in the contract. Unless otherwise provided, the contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies, and shall perform all work required to complete the project reasonably close conformity with drawings and specifications, and in accordance with provisions of the contract.

103

Section 104 - Maintenance for Traffic

104.01 Roads To Be Constructed

Unless otherwise provided in the SPECIAL PROJECT SPECIFICATIONS, existing roads, while undergoing improvement, shall be kept open to all traffic by the contractor and maintained in a condition that will adequately accommodate traffic. No work that interferes or conflicts with traffic or existing access to the roadway surface shall be performed until a plan for the satisfactory handling of traffic has been submitted by the contractor and approved by the Engineer. Specific requirements for temporary closures, detours, part-width construction and access to adjacent or intersecting facilities will be SHOWN ON THE DRAWINGS or described in SPECIAL PROJECT SPECIFICATIONS. Construction signing for traffic control shall conform to the Manual on Uniform Traffic Control Devices (MUTCD).

104
.02

Prior to the contractor shutting down any operations, the contractor shall take such precautions as may be necessary to prevent damage to the project, such as temporary detours, approaches, crossings or intersections; and shall make provisions for normal drainage and minimization of erosion. All travelways shall be left in a condition suitable for traffic.

The Government may permit use of portions of the project during periods that the contractor has shut down operations. All maintenance attributable to permitted use during periods of work suspension will be provided by the Government unless the maintenance results from fault or negligence of the contractor. Any maintenance not attributable to use, or necessary during suspensions resulting from fault or negligence of the contractor, shall be the contractor's responsibility.

104.02 Use of Roads by Contractor

The contractor is authorized to use Forest Service roads for all activities necessary for completion of this contract subject to the limitations and authorizations described in SPECIAL PROJECT SPECIFICATIONS, when such use will not cause damage to the roads or National Forest resources and when traffic can be accommodated safely.

Section 170 - Construction Staking, Transit L-Line

DESCRIPTION

170.01
Work

This work shall consist of the construction staking of a road project by the Transit L-line method in accordance with the drawings and specifications. The work includes furnishing all labor, equipment, instruments, materials, transportation, and other incidentals necessary to complete the construction staking in accordance with these specifications and acceptable engineering practice. The work shall also include setting grade-finishing stakes and staking major structures when required.

Construction staking shall be accomplished under the direction of a registered professional engineer or land surveyor. The professional engineer or land surveyor will be closely associated and familiar with the construction staking; periodic visits to the project site are required.

170
.01

MATERIALS

170.02
Stakes

All stakes shall have the nominal dimensions SHOWN ON THE DRAWINGS or stated in the SPECIAL PROJECT SPECIFICATIONS. Identification stakes and hubs shall be of sufficient length to provide a solid set in the ground and to provide space for marking above ground when applicable. Other dimensions and materials may be used, such as steel reinforcing bars, wire flagging and markers, and metal pins, if approved in writing by the Engineer. The top 2 inches of all slope, guard, reference, clearing, and structure stakes shall be painted or marked with plastic flagging. Colors used on stakes or for flagging shall be as SHOWN ON THE DRAWINGS or stated in SPECIAL PROJECT SPECIFICATIONS.

170.03
Survey Note
Paper & Books

Paper for survey notes shall be moisture-resistant paper. Notes shall be contained in books with covers that will protect the contents and retain the pages in numerical sequence during field use. Field notebooks or note paper shall be furnished by the contractor.

170.04
Government
Furnished Documents

The contractor will be furnished drawings, P-line survey notes, P-line to L-line offset data, construction staking notes, and the projected locations of catch points. One set of "as staked" drawings and all documents shall be returned to the Engineer.

SURVEY REQUIREMENTS

170.05
Precision

Precision and accuracy requirements are contained in tables 170-1 and 170-2. All work performed under this specification shall meet the precision requirements DESIGNATED in the SCHEDULE OF ITEMS or stated in the SPECIAL PROJECT SPECIFICATIONS.

170.06
Survey Notes

All notes shall become the property of the Forest Service. Slope stakes note format shall conform to that shown in figure 170-2. Other formats may be used if approved by the Engineer.

Manually recorded survey notes shall be printed in characters at least 0.15 inches high and shall be legible at a distance of 2.5 feet. Errors shall be deleted by lining out. Date, crew names and positions, instrumentation, and weather shall be recorded in the notes at the beginning of each day's work. The party chief shall sign or initial each page of the notes immediately after the last entry for each day's work.

Electronically recorded survey notes shall be consecutively numbered and headed to identify the contents. The notes shall be supported and accompanied by a bound Day Book that records the project name and for each day identifies date, crew names and positions, instrumentation, weather, type of survey, stationing of sections between which survey was performed, and survey data or

sketches that cannot be electronically recorded. The party chief shall sign or initial the electronically recorded notes and Day Book immediately after the last entry for each day's work.

170.07
Preliminary
Survey Line

A preliminary survey line has been established on the ground for this project with initial and specific succeeding survey points referenced. The contractor shall reestablish missing P-line points necessary to control subsequent construction staking operations to the precision designated in the SCHEDULE OF ITEMS, SHOWN ON THE DRAWINGS, or stated in the SPECIAL PROJECT SPECIFICATIONS.

170.08
Establishing
Centerline

The contractor shall determine the direction of centerline (L-line) tangents by coordinate ties furnished by the Forest Service. At least two points shall be located on each tangent to establish the direction of each tangent. The location of tangent lines established on the ground shall not be changed.

The deflection angle from one tangent to another shall be measured. When the measured deflection angle differs from the one SHOWN ON THE DRAWINGS, the measured angle and the curve external (E) SHOWN ON THE DRAWINGS shall be used to compute new curve data. The new curve data shall be computed and noted in the field books, and on the "as staked" drawings. The new control points (P.I., or P.C.'s & P.T.'s) shall be established on the ground using hubs and tacks.

170
.10

Stationing of centerline points shall be established by horizontal distance measurements and staked to the nearest 0.01 foot for control points and 0.1 foot for other points continuously throughout the project. Equations shall be introduced at the P.T. of curves to adjust field stationing to that SHOWN ON THE DRAWINGS when the difference between designed and located centerline stationing exceeds 5 feet. Centerline stakes shall be set at even 100-foot and 50-foot stations when practicable, at significant breaks in the ground, at culvert locations, at station equation points, or other stations indicated in the staking notes. Stakes shall not be more than 50 feet apart. Curves of 20 degrees or more shall be staked every 25 feet. All other curves shall be staked every 50 feet.

Where centerline stations fall in an existing trail, obstruction, or roadway, stakes shall be offset left or right from centerline (perpendicular to tangents and on the radial lines of curves) clear of the trail, obstruction, or roadway, and the offset distance marked on the side facing the centerline. The centerline point shall be a 20-penny or larger nail, flagged, and driven at least 1 inch below the road surface.

The survey line shall be cleared to facilitate travel and surveying. Clearing slash shall be removed from the travel or work area. All brush and trees shall be cut as near to the ground as possible.

170.09
Referencing
Centerline

The contractor shall reference centerline control points, which will be intervisible after clearing is completed to facilitate reestablishment of the centerline. References shall be measured to the precision of the centerline survey. References shall consist of two intersecting lines having an included angle of at least 30 degrees. The forward reference shall be placed a minimum of 25 feet outside the clearing limits as computed from the preliminary slope stake printout notes, and the rear hub or point on each line shall be not less than 30 feet beyond the forward hub or point. Reference points shall be marked with hubs and tacks.

170.10
Vertical Control
& "L" Profile
Levels

Bench marks established during the P-line survey that are within the clearing limits shall be relocated to points 20 feet or more outside the clearing limits. Elevation of relocated bench marks shall be determined by closed level circuits.

Bench marks shall be constructed to be permanent and to allow a level rod to stand vertically and squarely on the mark. Bench marks may be established by driving a 40-penny or larger nail into a notch cut in the base of a tree, by marking a point on a stable rock, or by other approved means. Spikes in trees shall be less than 12 inches above the ground. Location and descriptions of relocated bench marks shall be recorded in the level notes. At least two bench marks shall be set at each bridge and structural plate culvert site.

A closed level circuit shall be run over the L-line stations between bench marks to determine centerline ground elevations to the nearest 0.1 foot and to verify bench marks.

170.11
Discrepancies

170
.10

The contractor shall compare the staked centerline horizontal and vertical alignment with the design data. Differences between previously recorded and observed elevations of bench marks shall be referred to the Engineer. Differences exceeding 1 degree in angle found between the horizontal alignment data SHOWN ON THE DRAWINGS and the alignment observed on the ground shall be referred to the Engineer. Differences in centerline profile elevations exceeding 1 foot at any two or more consecutive points shall be reported to the Engineer for evaluation and possible revision. Staking of these areas shall be deferred until these differences are resolved by the Engineer.

170.12
L Topography
Cross Sections

Cross sections shall be taken at right angles to tangents and normal to curves at every staked point on the "L" profile line. The contractor shall determine the elevations of significant breaks in topography, breaks in the designed roadway template, and cross-section reference points. Ground shots for these cross sections shall be recorded in terms of feet plus or minus from ground at centerline, and horizontal distances from centerline. Cross sections shall be measured and recorded to the nearest 0.1 foot in elevation and nearest foot in horizontal distance, and shall extend approximately 20 feet beyond the designed clearing and grubbing limit on cut sections and approximately 20 feet beyond the toe of fill on fill sections.

Cross sections shall be identified at each end of the cross section with lath marked to show centerline station and the horizontal and vertical distance to the centerline.

Cross-section data shall be returned to the Engineer for recomputation of earthwork quantities and slope stake "catchpoint" printouts.

Slope stakes established during the "L" topography cross section phase of the work may be subject to relocation to adjust earthwork quantities.

170.13
Slope Stakes,
Clearing Limits,
& Reference
Stakes

Slope catchpoints, clearing limits, and slope reference stakes shall be established on both sides of the centerline at each "L" station established. The position of these stakes shall be determined by methods that will produce on the ground the designed template shown in the slope stake survey notes to the precisions shown in table 170-2 and specified for this contract. The slope stake "catchpoint distance" shown in the printout may be used as a trial location to initiate slope staking.

The cut or fill and horizontal distance to centerline, to bottom of ditch, or to shoulder as DESIGNATED by the Engineer shall be recorded on the slope stakes and in the slope stake notes as shown on figure 170-2.

Clearing limits shall be set on both sides of the centerline at each established "L" station within the tolerance shown on table 170-2. The clearing limit shall be located on the ground to the dimensions SHOWN ON THE DRAWINGS and marked with lath, flagging, or other methods approved by the Engineer. The total horizontal

distance from the centerline to the clearing limit at each section shall be recorded to the nearest foot in the field book.

The contractor shall establish slope reference stakes at a minimum horizontal distance of 10 feet outside the clearing limits and record on the stakes the horizontal distance to centerline and the vertical distance to the construction grade. The offset from the slope stake catchpoint, and slope stake catchpoint information as shown in figure 170-2, shall also be recorded on the reference stake, and in the slope stake book.

The elevation and location of slope reference stakes shall be verified for accuracy by:

(a) For Precision A. A differential level run over the reference stakes between bench marks.

(b) For Precisions B & C. Differential leveling between slope reference stakes of adjacent sections.

Where the difference in reference stake elevation between that established by slope staking and that observed by differential leveling exceeds the allowed tolerance, the slope stake shall be reset.

170.14
Monuments of
Property
Boundaries or
Surveys of Other
Agencies

If property boundary or survey monuments, or survey markers of other agencies, are found within or adjacent to the construction limits, the contractor shall immediately notify the Engineer.

170.15
Staking Culverts

Slope stakes and slope reference stakes shall be set at all culvert locations. A culvert reference stake and hub shall be set on the centerline of the culvert 10 feet from each end or beyond the clearing limit, whichever is greater. The following shall be recorded on these stakes:

(a) Diameter, actual field measured length, and type of culvert.

(b) The vertical and horizontal distance from hubs to the invert at the ends of the culvert.

When SHOWN ON THE DRAWINGS, headwalls for culverts shall be staked by setting a hub with a guard stake on each side of the culvert on line with the face of the headwall. (This work shall be performed after clearing is completed.)

170.16
Staking Drain Dips

Slope stakes and slope reference stakes shall be established on the projected centerline of the bottom of the dip at all drain dip locations as SHOWN ON THE DRAWINGS.

170.17
Staking Major
Structures

(a) Bridges. Bridge locations shall be designated on the ground by establishing reference points for the bridge centerline and the transverse centerline of one pier or abutment. Reference points shall be hubs and tacks set online beyond the construction limits and marked to identify the point and distance to the point referenced. At least one bench mark shall be set on each side of the stream beyond construction limits but close enough to the bridge site to allow direct leveling between the bench marks and the bridge without an intermediate setup. All of the above information shall be recorded in a separate book that includes a sketch showing the stream, bridge, and location of all construction stakes set. Staking shall be done to the accuracy standards shown in table 170-1.

(b) Cattleguards. Cattleguards shall be staked as SHOWN ON THE DRAWINGS.

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.17

() Other Structures. When required, other structures shall be staked as described in SPECIAL PROJECT SPECIFICATIONS and/or as SHOWN ON THE DRAWINGS.

170.18
Grade Finishing
Stakes

Finishing stakes shall be set when shown in the SCHEDULE OF ITEMS. Subgrade finishing stakes shall be blue tops. Base course finishing stakes shall be red tops.

Stakes shall be nominal 1-inch by 1-inch hubs and shall be of sufficient length to provide a solid set.

Finishing stakes shall be placed on the staked cross section and road template line. A stake shall be set at each shoulder and at centerline. Additional stakes shall be set when SHOWN ON THE DRAWINGS.

Finishing stakes shall be set when subgrade is within 0.5 feet, or base course is within 0.2 feet of final grade. The stakes shall be set to the nearest 0.02 feet of the measured grade line.

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170.19
Marking Stakes

All stakes shall be legibly marked in the format shown in figure 170-1 with a stake pencil that leaves an imprint or with waterproof ink. Marking shall conform to the nomenclature below:

PI	Point of intersection of tangents
PC	Point of curvature
POC	Point on curve
PT	Point of tangency
POT	Point on tangent
RP	Reference point
P	P-line (preliminary location line)
L	L-line (final location line)
BM	Bench mark
TBM	Temporary bench mark
BT	Begin taper (any)
ET	End taper (any)
BFTO	Begin full turnout
EFTO	End full turnout
BFEW	Begin full extra widening
EFEW	End full extra widening
DD	Drain dip
C	Cut
F	Fill
CL	Centerline
D	Ditch
W	Width

170.20
Stake Approval
& Maintenance

Construction work shall not begin within a roadway segment until the stakes, marks, and controls established by the contractor have been approved in writing by the Engineer. The minimum segment for approval shall be 2,000 feet or the length of the project, whichever is less.

Approval of the construction staking will not relieve the contractor of the responsibility for maintaining the survey work and for correcting errors, whether the errors are discovered during the actual survey work or in subsequent phases of the project. Stakes within the roadway need not be maintained after clearing operations have started.

MEASUREMENT

170.21
Method

The method of measurement, described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Reestablishing P-line includes all work needed to replace missing portions of the P-line that are necessary for the determination of L-line tangents. When listed in the SCHEDULE OF ITEMS, the quantity shall be the number of stations, measured to the nearest 0.1 station, of P-line reestablished. When the length of P-line

to be replaced does not exceed 10 percent of the measured length of the L-line, reestablishing P-line will be considered incidental to establishing centerline, and no separate payment will be made.

Establishing centerline includes all work necessary to establish and reference the centerline, establish vertical controls, determine the centerline profile elevations, and cross-section the original ground from the centerline datum established by this survey. The quantity shall be the number of miles measured to the nearest 0.01 mile of centerline completed and accepted.

Slope staking includes all work necessary to establish slope stakes, clearing limits, and reference stakes from a previously established centerline. The quantity shall be the number of miles, measured to the nearest 0.01 mile, of previously established centerline completed and accepted.

Finish staking includes all work necessary to reestablish the centerline to control placement of finish stakes and set the finish stakes. The quantity shall be the number of miles, measured to the nearest 0.01 mile, of previously established centerline completed and accepted.

Staking major structures includes all work necessary to establish lines and grades for the construction of the structure(s). The quantity shall be the actual number of structures of the type shown in the SCHEDULE OF ITEMS completed and accepted.

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.22

PAYMENT

170.22
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
170(01) Reestablish P-line, Precision _____	STA.
170(02) Establish Centerline, Precision _____	MI.
170(03) Slope Staking, Precision _____	MI.
170(04) Finish Staking, Subgrade, Precision _____ . . .	MI.
170(05) Finish Staking, Base Course, Precision _____ . .	MI.
170(06) Staking Major Structure(s), Type _____, Precision _____	EA.

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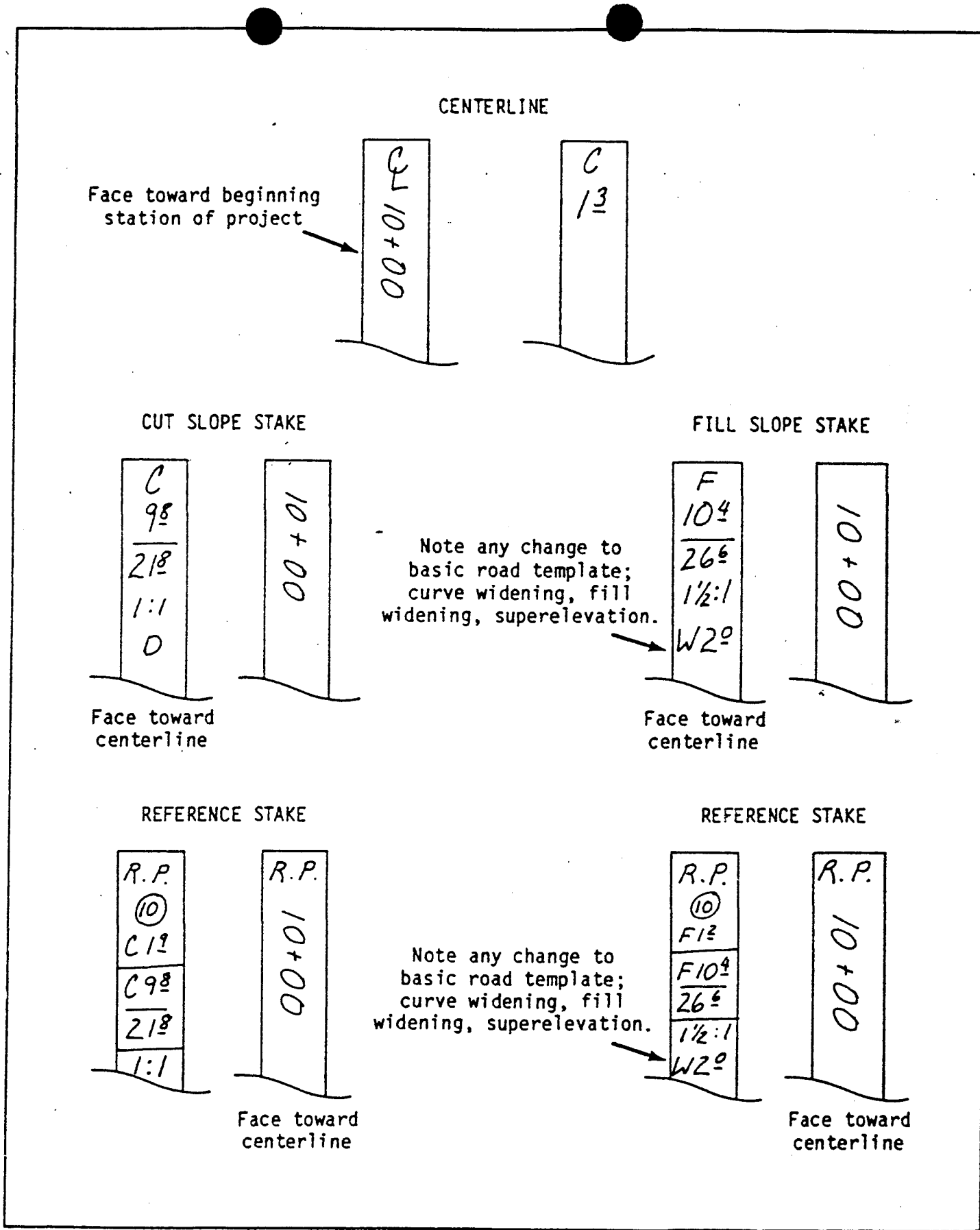


Figure 170-1.--Construction stakes.

Table 170-1.--Accuracy requirements for reestablishing P-line, traverse, and level circuits.

Precision Class	Minimum Position Closure	Angular Accuracy	L-Line Tangent Control Points ^a	Vertical Closure ^b
A (Bridges)	1/10,000	2 sets, direct/reverse 10" rejection limit	N/A	$0.035 \sqrt{M}$ or 0.002/sta. ^c
B	1/5000	2 sets, direct/reverse 20" rejection limit	0.1'	$0.05 \sqrt{M}$ or 0.02 ft/sta. ^c
C	1/1000	1 set, direct/reverse 1' rejection limit	0.2'	$0.10 \sqrt{M}$ or 0.05 ft/sta. ^c

^aAccuracy of offset measurement.

^bM is number of miles in traverse.

^cUse least value.

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Table 170-2.--Cross section and slope-stake precision.

Item	Precision		
	A	B	C
Allowable deviation of cross section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves.	$\pm 2^\circ$	$\pm 3^\circ$	$\pm 3^\circ$
Cross section topography measurements shall be taken so that variations in ground from a straight line connecting the cross section points will not exceed:	0.5 ft	1.0 ft	2.0 ft
Horizontal and vertical accuracy for cross sections. In feet or percentage of horizontal distance measured from traverse line, whichever is greater.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%
Horizontal and vertical accuracy for slope stake, slope stake references, and clearing limits. In feet or percentage of horizontal distance measured from centerline or reference stake, whichever is greater.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%
a. Slope reference stakes and slope stakes.	0.1 ft or 0.4%	0.15 ft or 0.6%	0.2 ft or 1.0%
b. Clearing limits.	1.0 ft	1.0 ft	1.0 ft

Section 201 - Clearing & Grubbing

DESCRIPTION

201.01
Work

This work shall consist of clearing, grubbing, trimming, removing, and disposing of or treatment of timber, construction slash, and debris. This work shall also include preservation of vegetation and objects DESIGNATED to remain from injury or defacement.

CONSTRUCTION

201.02
Clearing & Grubbing

All debris, trees, stumps, roots, and other protruding vegetative material within the clearing limits, not DESIGNATED to remain, shall be cleared, grubbed, removed, and disposed of, except the following:

(a) Undisturbed stumps outside the roadway or in embankment areas, provided they do not extend more than 12 inches above the original ground (measured from the uphill side) nor closer than 2 feet to the finished subgrade or 1 foot to any slope surface or as otherwise SHOWN ON THE DRAWINGS and they do not interfere with the placement or compaction of embankments.

(b) Grubbing of pits, channel changes, rock sections, and ditches, below the depth of the proposed excavation.

All roots over 3 inches in diameter within the roadbed area shall be grubbed to a minimum depth of 6 inches below subgrade. Roots over 3 inches in diameter protruding from the excavated slope shall be cut flush with the excavated slope surface. 201 .03

Unless shown otherwise in the SPECIAL PROJECT SPECIFICATIONS, trees shall be felled into the area being cleared when ground conditions, tree lean, and shape of clearing permit. Controlled felling shall be used that will ensure the direction of fall when necessary to prevent damage to property, structures, trees DESIGNATED to remain, or traffic.

Fire-dangerous dead trees or unstable live trees, DESIGNATED by the Engineer within 200 feet slope distance of the centerline of roads shall be cut off not more than 12 inches above the uphill ground line and treated in accordance with Subsections 201.03 and 201.05.

Branches on remaining trees or shrubs shall be trimmed to give a clear height of 14 feet above the roadbed unless otherwise SHOWN ON THE DRAWINGS. Tree limbs shall be trimmed as near flush with the trunk as practicable.

201.03
Utilization of
Timber

Merchantable timber is timber that meets utilization standards in the SPECIAL PROJECT SPECIFICATIONS. Logging methods and utilization shall conform to the following:

(a) Felling and Bucking. Felling shall be done to minimize damage to merchantable timber and damage to remaining trees outside of clearing limits. Felling shall be done with saws or shears unless shown otherwise in the SPECIAL PROJECT SPECIFICATIONS.

Bucking shall be done to permit removal of all minimum pieces set forth in SPECIAL PROJECT SPECIFICATIONS.

(b) Utilization and Removal of Timber. Trees that equal or exceed the diameters and minimum lengths listed in the SPECIAL PROJECT SPECIFICATIONS and contain one minimum piece shall be removed or disposed of by one of the following methods as shown in the SCHEDULE OF ITEMS.

(1) The disposal of merchantable timber designated for removal shall be done in accordance with the B(BT) provisions of the Timber Sale Contract.

(2) Logs meeting utilization standards shall be limbed and decked at locations SHOWN ON THE DRAWINGS or at locations approved by the Engineer. Decking shall be done in such a manner that logs are piled parallel one to the other, can reasonably be removed by standard log loading equipment, will not damage standing trees, and will not roll. Decks shall be free of brush and soil.

(3) Removal from Government Land. Merchantable timber, designated for removal, shall become the property of the contractor without charge and removed from Government land. This timber shall not be exported from the United States nor used as substitution (as defined in 23 CFR 223.10) for timber from private lands exported by the contractor or an affiliate directly or indirectly.

(4) Disposal as Unmerchantable Timber. Timber on this project is not considered merchantable and shall be disposed of in accordance with Subsection 201.05 for the treatment methods SHOWN ON THE DRAWINGS and in the SCHEDULE OF ITEMS.

201.04
Pioneer Roads

The construction of pioneer roads shall be confined to inside the roadway unless otherwise approved by the Engineer.

201 201.05
.03 Slash Treatment

Treatment of construction slash larger than 3 inches in diameter and 3 feet in length shall be accomplished by one or more of the following methods as shown in the SCHEDULE OF ITEMS:

- (1) Windrowing Construction Slash
- (2) Windrowing of Large Material
- (3) Windrowing and Covering
- (4) Scattering
- (5) Burying
- (6) Chipping
- (7) Piling and Burning
- (8) Decking Unmerchantable Material
- (9) Disposal in Cutting Units
- (10) Removal
- (11) Piling
- (12) Placing Slash on Embankment Slopes

Pieces of wood less than 3 inches in diameter and 3 feet in length may be scattered within the clearing limits.

(a) All Methods. No construction slash shall be deposited in lakes, meadows, streams, or streambeds. Construction slash that interferes with drainage structures shall be removed immediately.

Trees adjacent to the clearing limits scorched or damaged beyond recovery shall be felled and disposed of in accordance with Subsection 201.03 or treated as construction slash.

(b) Specific Methods

(1) Windrowing Construction Slash. Unless specified otherwise in the SPECIAL PROJECT SPECIFICATIONS, the contractor

shall meet the following requirements. Areas used to windrow construction slash shall be cleared to accommodate the windrow. Construction slash shall be placed outside the roadway in neat, compacted windrows laid approximately parallel with and along the toe-line of embankment slopes. The top of windrows shall not extend above the subgrade. All material in the windrow shall be matted down with construction equipment to form a compact and uniform pile. Windrows shall have 16-foot minimum length breaks at least every 200 feet. Windrows shall not be placed against trees. A pioneer road may be constructed to provide an area for placement of windrows provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.

(2) Windrowing of Large Material. Construction slash 10 inches or more in diameter at the small end and 6 feet or more in length shall be windrowed as in (1) above. Smaller material shall be treated by one or more of the other included methods for slash treatment.

(3) Windrowing and Covering. Construction slash shall be placed and compacted as in (1) above and shall be covered with at least 6 inches of rock and soil to form a smooth and uniform windrow.

(4) Scattering. Unless specified otherwise in the SPECIAL PROJECT SPECIFICATIONS, the contractor shall meet the following requirements. Construction slash shall be scattered outside the clearing limits without damaging trees. All logs shall be limbed. Logs and stumps shall be placed away from trees, positioned so they will not roll, and not be placed on top of one another. Other construction slash shall be limbed and scattered to reduce slash concentrations.

201
.05

(5) Burying. Construction slash shall be buried at the locations SHOWN ON THE DRAWINGS and DESIGNATED on the ground. Construction slash shall be matted down in layers and covered with at least 2 feet of rock and soil. The final surface shall be smoothed and sloped to drain.

(6) Chipping. Construction slash up to at least 4 inches in diameter and longer than 3 feet shall be processed through a chipping machine. Chips shall be deposited on embankment slopes or outside the roadway to a loose depth not exceeding 6 inches. Minor amounts of chips may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.

(7) Piling and Burning. Construction slash shall be deposited in areas SHOWN ON THE DRAWINGS and DESIGNATED on the ground. Piles shall be constructed so that burning does not damage standing trees. If burning is incomplete, the slash remaining shall be repiled and burned until pieces are reduced to less than 3 inches in diameter and 3 feet in length. These pieces shall then be scattered.

(8) Decking Unmerchantable Material. Logs not meeting utilization standards in Subsection 201.03 and other material that exceeds the diameter and length shown in the SPECIAL PROJECT SPECIFICATIONS shall be decked in areas SHOWN ON THE DRAWINGS. Other locations may be approved by the Engineer.

Material shall be cut into lengths not to exceed 32 feet and all limbs removed. Decks shall be stable and free of brush and soil. Other material shall be treated according to slash treatment methods SHOWN ON THE DRAWINGS and in the SCHEDULE OF ITEMS.

(9) Disposal in Cutting Units. Construction slash from within cutting units and 200 feet adjacent thereto shall be disposed of with logging slash. Such construction slash shall be deposited at least 50 feet inside the cutting unit boundary in

such a manner that it will not inhibit logging of the unit and that it may be treated by the prescribed logging slash treatment method.

(10) Removal. Construction slash shall be removed or hauled to locations SHOWN ON THE DRAWINGS and DESIGNATED on the ground.

(11) Piling. Construction slash shall be piled in areas SHOWN ON THE DRAWINGS and DESIGNATED on the ground for later burning or disposal by others. Piles shall be placed and constructed so burning will not damage remaining trees. All stumps shall be reasonably free of dirt. Unmerchantable logs shall be cut into lengths less than 20 feet prior to placement in the pile.

(12) Placing Slash on Embankment Slopes. Construction slash shall be placed on completed embankment slopes to reduce soil erosion where SHOWN ON THE DRAWINGS. Construction slash shall be placed as flat as practicable on the completed slope. Slash shall be placed from the toe of the embankment to a point at least 2 feet below subgrade elevation. Priority for the use of available slash shall be given to (1) through fills, (2) inside of curves, and (3) ditch relief outlets.

MEASUREMENT

201.06
Method

201
.05

The method of measurement, described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Linear measurements will be horizontal along the road centerline.

Quantities will be number of acres and fractions thereof within the clearing limits, regardless of the amount of work required.

The quantity for individual removal of trees will be the number of trees of the various size-designations removed. Tree diameters will be measured at a height of 12 inches above the ground. Trees less than 6 inches in diameter will not be counted.

<u>Size of Least Diameter At Height of 12 Inches</u>	<u>Pay Item Designation</u>
Over 6 inches to 24 inches	Small
Over 24 inches to 40 inches	Medium
Over 40 inches	Large

When an item for "Individual Removal of Trees, Miscellaneous" is shown in the SCHEDULE OF ITEMS, measurement will be the number of trees designated to be removed regardless of size.

~~PAYMENT~~

~~201.07
Basis~~

~~The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.~~

~~Payment will be made under:~~

<u>Pay Item</u>	<u>Pay Unit</u>
201(01) Clearing and Grubbing, Slash Treatment Methods for Tops and Limbs _____, Logs _____, and Stumps _____, _____, Utilization of Timber _____	ACRE
201(02) Clearing and Grubbing, Slash Treatment Methods for Tops and Limbs _____, Logs _____, and Stumps _____, _____, Utilization of Timber _____	STA.

Section 203 - Excavation & Embankment

DESCRIPTION

- 203.01
Work
- This work shall consist of excavation and shaping of roadway, borrow excavation, drainage excavation, removal of slide material, excavation of unsuitable material, embankment construction, and disposal of all excavated material necessary for the completion of construction including roadway ditches, channel changes, furrows, slope rounding, benches, berms, dips, approaches, and subsidiary work.
- 203.02
Excavation
- Excavation shall consist of the excavation and disposal of all excavated material, regardless of its nature, that is not included under other pay items listed in the SCHEDULE OF ITEMS.
- 203.03
Borrow Excavation
- Borrow excavation shall consist of the excavation and utilization of material from sources SHOWN ON THE DRAWINGS or described in the SPECIAL PROJECT SPECIFICATIONS. Additional sources of borrow excavation will be subject to approval in advance by the Engineer. Development of sources shall be in accordance with Section 611.

CONSTRUCTION

- 203.04
203 Clearing & Grubbing
.01
- Clearing and grubbing shall be accomplished in accordance with Section 201 before work under Section 203 begins, except pioneer roads and slash disposal, and grubbing of stumps when approved by the Engineer may proceed concurrently with excavation, and the burning of slash may be delayed until weather permits. Excavation and placement operations shall be conducted so material to be treated under Section 201 will not be incorporated in the roadway.
- 203.05
Pioneering
- Pioneering operations for the top of excavation slopes, toe of embankments, or pioneer road construction shall prevent undercutting of the final excavation slope, depositing of materials outside of the roadway limits, and any restriction of drainage.
- 203.06
Utilization of
Excavated Materials
- All suitable, excavated material shall be used in the construction of embankments, subgrades, shoulders, slopes, bedding, and backfill for structures and for other purposes as SHOWN ON THE DRAWINGS.
- (a) Excess Excavation. Designed excess excavation shall be disposed of as SHOWN ON THE DRAWINGS.
- (b) Rock for Slope Protection. Excavated rock suitable for protection of embankments may be conserved and used in lieu of a DESIGNATED materials source.
- (c) Conserving Material. Material encountered in the excavation, suitable for cushion, road finishing, or other purposes, may be conserved and utilized instead of materials from DESIGNATED sources. Excessively wet material that is otherwise suitable for embankment shall be field drained and dried before placement.
- (d) Excavation of Unsuitable Material. Unsuitable material shall be excavated. Disposal will be as SHOWN ON THE DRAWINGS. Excavated areas shall be backfilled with suitable material when necessary to complete the work. Frozen material shall not be placed in embankments. Rocks that are too large to be incorporated into the embankment shall be broken for incorporation into the embankment, maneuvered to the face of the embankment and embedded so that they will not roll or obstruct the use and maintenance of the roadbed, or moved to locations approved by the Engineer.

(e) Conservation of Topsoil. When SHOWN ON THE DRAWINGS, suitable topsoil shall be removed, transported, and deposited in the DESIGNATED stockpile areas.

(f) Abandoned Structures and Obstructions. Abandoned structures and obstructions shall be treated in accordance with Section 202.

203.07
Drainage Excavation

Drainage excavation shall include construction of side ditches, minor channel changes, inlet and outlet ditches, furrow ditches, ditches constructed along the road but beyond the roadway limits, and other minor earth drainage structures as SHOWN ON THE DRAWINGS. Excavated material shall be utilized in accordance with Subsection 203.06.

203.08
Finishing Roadbed

For roads receiving aggregate base or surface course, only rocks that do not protrude above the subgrade more than one-third of the depth of the base or surface course, or 3 inches, whichever is less, may remain in place.

For unsurfaced roads, unless otherwise SHOWN ON THE DRAWINGS, the top 4 inches below the finished road surface shall not contain rocks larger than 4 inches in greatest dimension. Oversize material shall be removed, reduced to acceptable size, or covered by importing suitable material approved by the Engineer.

The subgrade shall be visibly moist during shaping and dressing. Low sections, holes, cracks, or depressions shall be brought to grade with suitable material approved by the Engineer. Final compaction of the subgrade shall meet the requirements of the embankment placing method specified.

203.09
Snow Removal

Snow or ice shall not be incorporated in the embankment. Snow shall be removed in advance of the work and deposited beyond the roadway limits in a manner that will not cause resource damage nor waste material.

203.10
Finishing Slopes

Finished slopes shall conform reasonably to the lines STAKED ON THE GROUND or SHOWN ON THE DRAWINGS. The finished slope shall be left in a roughened condition to facilitate the establishment of vegetative growth. The finish associated with template and stringline or handraking methods will not be allowed. Loose rock, loose debris, and other loose material, each of which is larger than 6 inches in diameter, shall be removed from the slope unless otherwise SHOWN ON THE DRAWINGS.

The tops of excavations, excluding areas of solid rock, shall be blended with the adjacent terrain by rounding where SHOWN ON THE DRAWINGS. Decomposed rock that may be cut without blasting or ripping shall be rounded. Earth overlying rock shall be rounded above the rock.

All rock excavations that require blasting shall be formed with controlled blasting techniques unless otherwise SHOWN ON THE DRAWINGS. Controlled blasting is defined as the controlled usage of explosives and blasting accessories in appropriately aligned and spaced drill holes for the purpose of producing a free surface or shear plane in the rock excavation slopes and of minimizing landscape damage, adjacent ground vibration, and overbreak. Presplitting is not intended unless SHOWN ON THE DRAWINGS and described in the SPECIAL PROJECT SPECIFICATIONS.

Unless directed otherwise by the Engineer, the contractor shall drill, blast, and excavate short test sections (not to yield in excess of 1,000 cubic yards) to determine the controlled blasting method, hole spacing, and charge best suited to the material encountered.

203.11
Overbuilding &
Landscape & Stream
Protection

Unless otherwise agreed to by the Engineer, excavation or embankment material shall be confined within the roadway limits to avoid overbuilding and to protect the landscape and streams.

203
.11

203.12
Subgrade Treatments

Subgrade treatment shall consist of soil modification by admixing aggregates, placing geotextiles, fiber mat, wood corduroy, rock blanket, or other similar materials over areas of unsuitable embankment foundation material that are SHOWN ON THE DRAWINGS. The construction and material requirements for the type of subgrade treatment will be specified in the SPECIAL PROJECT SPECIFICATIONS or SHOWN ON THE DRAWINGS.

203.13
Earth Berms

Permanent earth berms shall be constructed along the shoulder of the traveled way at locations SHOWN ON THE DRAWINGS. Material used in the construction of berms shall be well graded with no rocks having a dimension greater than one-fourth the height of the berm.

Acceptable material for the berm may be windrowed as the roadbed is constructed. When the local material is not acceptable, material shall be imported from approved sources. Material used for berm construction shall contain no frozen material, roots, sod, or other deleterious material. Material shall not be wasted over the embankment slope.

Compaction shall be accomplished by operating the spreading equipment over the full section of the berm.

203.14
Water

Water development, hauling, and application shall be in accordance with Section 207.

203.15
Embankment Placing
Methods

(a) All Methods. When an embankment is to be placed across swampy ground and removal of unsuitable material or subgrade treatment is not required, the lower part of the embankment shall be constructed in a single layer to the minimum depth necessary to support construction equipment.

(b) Specific Methods. All embankments shall be placed by one or more of the following methods as SHOWN ON THE DRAWINGS and listed in the SCHEDULE OF ITEMS:

Method 1. Side Casting and End Dumping. Embankment may be placed by side casting and end dumping. Where material containing a large amount of rock is used to construct embankments, a solid embankment shall be provided by working smaller rocks and fines in with the larger rocks and fines to fill the voids.

Method 2. Layer Placement. Surfaces steeper than a ratio of 3 horizontal to 1 vertical (3:1) upon which embankment is to be placed, shall be roughened or stepped when SHOWN ON THE DRAWINGS to provide permanent bonding of new and old materials.

Embankment shall be layer placed, except over rock surfaces, in which case material may be placed by end dumping to the minimum depth needed for operation of spreading equipment. Each embankment layer shall be leveled and smoothed before placement of subsequent layers. Hauling and spreading equipment shall be operated uniformly over the full width of each layer.

Suitable material shall be placed in layers no more than 12 inches thick, except when the material contains rock more than 9 inches in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. No layer shall exceed 24 inches before compaction.

Placing individual rocks or boulders greater than 24 inches will be permitted provided the embankment will accommodate them. Such rocks and boulders shall be at least 6 inches below subgrade. They shall be carefully distributed and the voids filled with finer material to form a dense and compacted mass.

Where material containing large amounts of rock is used to construct embankments, the layers may be of sufficient thickness to accommodate the material involved. A solid embankment with

adequate compaction shall be constructed by working smaller rock and fines in with the larger rocks to fill the voids and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

Material shall be at a moisture content suitable to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Excessively wet material shall be handled in accordance with Subsection 203.06(c).

Method 3. Layer Placement (Roller Compaction). Embankments shall be placed as specified in Method 2. Placement shall be in horizontal layers not exceeding 12 inches prior to compaction except when the material contains rock more than 9 inches in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. Compaction shall be obtained by equipment in compliance with the requirements of Subsection 212.02(a), (b), (c), or (d). Compaction equipment shall be operated over the full width of each layer until visible deformation of the layer ceases or in the case of the sheepfoot roller, the roller "walks out" of the layer. At least three complete passes shall be made.

Method 4. Controlled Compaction. Embankments shall be placed as specified in Method 2, except earth embankments shall be placed in horizontal layers not exceeding 12 inches (loose measure) and compacted. Material shall be at a moisture content suitable for attaining the required compaction. Embankments and the top 1 foot of excavation sections shall be compacted to at least 95 percent of the maximum density as determined by AASHTO T 99, Method C or D. 203 .16

The density of the embankment material will be determined during the progress of the work in accordance with AASHTO T 191, T 205 or T 238; T 217, T 239, or T 255; and T 224.

Density requirements will not apply to portions of rock embankments that cannot be tested in accordance with approved methods. When this condition exists, compaction shall be provided by working smaller rocks and fines in with the larger rocks to fill the voids and by operating equipment over the embankment materials.

Method 5. Controlled Compaction Using Density Control Strips. The embankment placement requirements for Method 4 shall apply for this method except that compaction shall be performed in accordance with Section 212. Where portions of rock embankment are constructed that cannot be tested in accordance with approved methods, each layer shall be rolled full width with the same number of passes as the adjacent embankment containing material represented by a control strip.

Method 6. Special Project Controlled Compaction. Embankments shall be placed and compacted to at least 90 percent of the maximum density determined by AASHTO T 180, Method C or D, except that compaction of not less than 95 percent of AASHTO T 180, Method C or D, shall be obtained for a minimum depth of 1 foot below subgrade for the width of the roadbed in both excavation and embankment sections.

The density will be determined during the work in accordance with AASHTO T 191, T 205 or T 238; T 217, T 239 or T 255; and T 224.

203.16
Construction
Tolerances

The tolerance class shall be as SHOWN ON THE DRAWINGS. Roadway ditches shall be constructed to flow in the direction SHOWN ON THE DRAWINGS.

Deviations shall be uniform in the direction of change for a distance of 200 feet or more along the project centerline.

Item	Tolerance Class ^a									
	A	B	C	D	E	F	G	H	I	J
Roadbed Width (Feet)	+0.5	+0.5	+1	+1	+1	+1	+1	+1.5	+1	+2
Subgrade Elevation (Feet)	±0.1	±0.2	±0.2	±0.5	±0.5	±1	±1	±1.5	±2	±3
Centerline Alignment (Feet)	0.2	0.2	0.5	0.5	1	1	1	1.5	2	3
Slopes, Excavation and Embankment (Percent Slope) ^b	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10

^aMaximum allowable deviation from construction stakes and drawings.

^bMaximum allowable deviation from staked slope measured from slope stakes or hinge points.

203.17
(Reserved)

MEASUREMENT

203.18
Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Quantities of excavation will include:

- (a) Roadway excavation.
- (b) Rock and unsuitable material below the required grade and unsuitable material beneath embankment areas.
- (c) Furrow ditches outside the roadway, except when furrow ditches are included in the SCHEDULE OF ITEMS.
- (d) Topsoil and other material removed and stockpiled as directed.
- (e) Borrow material used in the work, except when borrow is included in the SCHEDULE OF ITEMS.
- (f) The volume of conserved materials taken from stockpiles and used in the work, except topsoil included under other pay items.
- (g) Slide material not attributable to negligence of the contractor.

Quantities of excavation will not include the following:

- (a) Material used for other than approved purposes.
- (b) Unauthorized excavation or borrow.
- (c) Quantity of material excavated from slope rounding.
- (d) Overbreakage from the backslope in rock excavation requiring blasting.
- (e) Material scarified in place to receive the first layer of embankment.
- (f) Benching or stepping existing ground for embankment foundation.
- (g) Stepping or scaling cut slopes.
- (h) Oversize material removed when finishing unsurfaced roads.

When designed quantities are DESIGNATED in the SCHEDULE OF ITEMS as the method of measurement, the quantities are estimated from design data based on undisturbed ground surface elevations.

When staked quantities are shown in the SCHEDULE OF ITEMS, excavation quantities will be determined by the average end area method using slope stake information taken prior to construction.

When actual quantities are DESIGNATED in the SCHEDULE OF ITEMS as the method of measurement, preliminary cross sections or comparable measurements will be taken of the undisturbed ground surface and quantities finally measured in accordance with the following:

(a) When excavation is DESIGNATED as a pay item in the SCHEDULE OF ITEMS, final cross sections or comparable measurements will be taken of the completed and accepted work.

(b) When embankment is DESIGNATED as a pay item in the SCHEDULE OF ITEMS, measurement will be in the final position.

(c) When borrow is DESIGNATED as a pay item by the cubic yard in the SCHEDULE OF ITEMS, measurement will be in the original position.

~~PAYMENT~~

~~203.19
Basis~~

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

203
.19

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
203(01) Excavation, Placement Method 1	C.Y.
203(02) Excavation, Placement Method 2	C.Y.
203(03) Excavation, Placement Method 3	C.Y.
203(04) Excavation, Placement Method 4	C.Y.
203(05) Excavation, Placement Method 5	C.Y.
203(06) Excavation, Placement Method 6	C.Y.
203(07) Excavation, Placement Method _____ . . .	STA.
203(08) Excavation, Placement Method _____ . . .	MI.
203(09) Excavation, Placement Method _____ . . .	L.S.
203(10) Borrow Excavation, Placement Method _____	C.Y.
203(11) Borrow Excavation, Placement Method _____	TON
203(12) Unsuitable Excavation	C.Y.
203(13) Embankment, Placement Method _____	C.Y.
203(14) Embankment, Placement Method _____	STA.
203(15) Embankment, Placement Method _____	MI.

Section 206A - Excavation for Culverts & Minor Structures

DESCRIPTION

206A.01
Work

This work shall consist of all excavation for foundations of culverts and minor structures, backfilling of completed structures, and disposal of excavated material. The footing for a bottomless arch culvert shall be considered a minor structure.

This work shall include all excavation below the designed slope or subgrade line as SHOWN ON THE DRAWINGS, excavation of unsuitable foundation material, and furnishing and placing approved foundation material.

This work shall also include necessary diverting of live streams, pumping, bailing, draining, sheeting, bracing, and miscellaneous items required for execution of the work.

CONSTRUCTION

206A.02
Clearing & Grubbing

Before starting excavation in any area, all necessary clearing and grubbing in that area shall have been completed in accordance with Section 201.

206A.03
Excavation

Excavation for culverts and foundation pits for minor structures shall be excavated to the lines and grades or elevations SHOWN ON THE DRAWINGS or as DESIGNATED on the ground. Excavations shall be of sufficient size to permit the placing and backfilling of culverts, minor structures, or minor structure footings. Boulders, logs, and any other unsuitable materials encountered shall be removed and disposed of in areas SHOWN ON THE DRAWINGS.

(a) Minor Structures. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface that is level, stepped, or serrated. All loose and disintegrated rock and thin strata shall be removed. When the footing is to rest on material other than rock, excavation to final grade shall not be completed until just before the footing is to be placed. When the foundation material is soft or otherwise unsuitable, it shall be removed and replaced with approved granular material. The contractor shall notify the Engineer when each excavation is completed and will receive written approval of the excavation and the foundation material prior to placing footings.

(b) Culverts. The width of trenches in natural ground shall permit satisfactory joining and thorough tamping of the bedding material under and around the culvert, and shall be at least as wide as the culvert diameter plus 2 feet.

Where culverts are to be placed in trenches excavated in embankments, then the excavation shall be at least as wide as one diameter plus one diameter on each side.

Unsuitable foundation material shall be excavated below the invert of the culvert to an approximate depth of 2 feet and a width of at least the culvert diameter plus 4 feet. Unsuitable material shall be replaced with selected granular foundation material and compacted to obtain a uniform foundation.

Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the foundation grade for a depth of at least 1 foot. The width of the excavation shall be at least 2 feet greater than the outside width of the culvert. This excavated material shall be replaced with selected mineral soil meeting the requirements for backfill in Subsection 603.08 and compacted in accordance with Subsection 603.08.

206A.04
Utilization of
Excavated Materials

All suitable excavated material shall be utilized as backfill or embankment. No excavated material shall be placed in live streams. All surplus material shall be disposed of as SHOWN ON THE DRAWINGS. No excavated material shall be deposited in a manner that will endanger the partly finished structure.

206A.05
Backfill &
Embankments for
Minor Structures
Other Than Pipe
Culverts

Excavated areas around minor structures shall be backfilled with selected material placed in horizontal layers, not over 6 inches (loose measure) in depth, to the level of the original ground surface. Backfill shall be readily compactible material free of frozen lumps, chunks of highly plastic clay, or other objectionable material. Rocks larger than 3 inches in diameter shall not be used within 1 foot of the structure. Each layer shall be compacted in accordance with Subsection 203.15(b), Method 4.

206A.06
Bedding, Backfill,
& Embankment for
Pipe Culverts

Bedding, backfill, and embankment for pipe culverts shall be in accordance with Section 603.

206A.07
(Reserved)

MEASUREMENT

206A.08
Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Quantities of excavation will include:

(a) For box culverts, headwalls, minor concrete and stone masonry structures, and minor drainage structures other than pipe culverts, measurement will be between vertical planes 18 inches outside the base of the masonry sections SHOWN ON THE DRAWINGS or as DESIGNATED, and between the foundation grade and the natural ground surface.

(b) For pipe culverts, measurement shall be between the original ground surface, and the bottom excavations and to the minimum width required under 206A.03(b) paragraph 1, 2, 3, or 4 as applicable.

PAYMENT

206A.09
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
206A(01) Minor Structure Excavation	C.Y.
206A(02) Pipe Culvert Excavation	C.Y.
206A(03) Bedding Material	C.Y.
206A(04) Bedding Material	TON
206A(05) Foundation Material	C.Y.

206
.09

Section 304 - Aggregate Base or Surface Course

DESCRIPTION

304.01
Work

This work shall consist of furnishing, hauling, and placing aggregate base or surface course on the subgrade or base or stockpile site approved by the Engineer. Work may include additive mineral filler, or binder as specified in the SPECIAL PROJECT SPECIFICATIONS. Aggregate production shall be by pit-run, grid-rolling, screening, or crushing methods or furnished by the Government, as shown in the SCHEDULE OF ITEMS.

MATERIALS

304.02
Source

Materials shall be obtained from sources or stockpiles SHOWN ON THE DRAWINGS or other approved sources. Grid-rolling shall utilize all suitable material that can be reduced to maximum size as shown in the SCHEDULE OF ITEMS.

Development and utilization of government-furnished sources shall be in accordance with Section 611.

304.03
Gradation

Grading requirements for crushing or screening operations shall meet the requirements of Subsection 703.06.

No gradation other than maximum size will be required for pit-run or grid-rolled material. After processing on the road, all oversize material shall be removed from the road and disposed of as SHOWN ON THE DRAWINGS.

304.04
Quality

All aggregate except Government-furnished stockpiles or from designated sources shall meet the quality requirements of Subsection 703.06 unless otherwise required in the SPECIAL PROJECT SPECIFICATIONS.

304.05
Additives

Chemical additives, if required, shall meet the requirements of the following subsections: 304.09

Magnesium Chloride	712.11
Calcium Chloride	712.02
Sodium Chloride	712.02
Hydrated Lime	712.03

304.06
Water

Water development, hauling, and application shall be in accordance with Section 207.

304.07
Mineral Filler
or Binder

Mineral filler or binder shall be added, as specified in the SPECIAL PROJECT SPECIFICATIONS, to meet quality and/or gradation requirements. Mineral filler or binder shall be added and uniformly blended on the road when pit-run, grid-rolling, or screening methods are used or when aggregate is being furnished by the Government. Mineral filler or binder shall be uniformly blended during crushing when a crusher operation is used.

CONSTRUCTION

304.08
Preparation of
Roadbed

The roadbed shall be completed in accordance with Section 203 or 306 and approved in writing by the Engineer before placing base or surface course.

304.09
Mixing & Placing

The contractor may mix the aggregate and any required additives, water, mineral filler, and binder by any one of the three following methods unless a required method is SHOWN ON THE DRAWINGS:

(a) Stationary Plant Method. The aggregate shall be mixed with other required materials in an approved mixer. Water shall be added during the mixing operation in the amount necessary to provide the moisture content for compacting to the specified

density. After mixing, the aggregate shall be transported to the jobsite while it contains the proper moisture content and shall be placed on the subgrade or base course by means of an aggregate spreader.

(b) Travel Plant Method. After the aggregate for each layer has been placed with an aggregate spreader or windrow sizing device, it shall be uniformly mixed with other required materials by a traveling mixing plant. During mixing, water shall be added to provide the necessary moisture content for compacting.

(c) Road Mix Method. After the aggregate for each layer has been placed, it shall be mixed with other required materials at the required moisture content until the mixture is uniform throughout.

The aggregate shall be spread in a uniform layer, with no segregation of size, and to a loose depth that shall have the required thickness when compacted.

If the required compacted depth of any aggregate base or surface course exceeds 6 inches, it shall be placed in two or more layers of approximately equal thickness. If the nominal maximum particle size exceeds 3 inches, the aggregate shall be placed in layers that do not exceed twice the maximum size of the aggregate size specified.

Hauling equipment shall be operated over the surface of the previously constructed layer in a dispersed manner to minimize rutting or uneven compaction.

304.10
Compaction

The aggregate shall be compacted by one of the following methods as specified on the SCHEDULE OF ITEMS:

Compaction A. Aggregate shall be compacted by operating spreading and hauling equipment over the full width of each layer of the aggregate.

Compaction B. Aggregate shall be moistened or dried to a uniform moisture content suitable for compaction. Rollers meeting the requirements of Subsection 212.02(b), (c), or (d) shall be operated over the full width of each layer until visual displacement ceases, but not fewer than three complete passes.

Compaction C. Each layer of aggregate shall be compacted to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, Method C or D.

Compaction D. Each layer of aggregate shall be compacted to a density of at least 95 percent of the maximum density, as determined by AASHTO T 180, Method C or D.

Compaction E. Each layer of aggregate shall be compacted to at least 95 percent of the target density as determined by the control strip in Subsection 212.03.

Compaction F. Pit-run and grid-rolled produced materials shall be visually moist and compacted by operating compaction equipment defined in Subsection 212.02 over the full width of each layer until visual displacement ceases.

The surface of each layer shall be bladed during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, the density of each layer will be determined in accordance with ASSHTO T 191, T 205 or T 238; T 217, T 239 or T 255; and T 224.

304.11
Stockpiling

If shown in the SCHEDULE OF ITEMS or if the contractor elects to produce and stockpile aggregates prior to placement, the aggregates shall be handled and stockpiled in accordance with the requirements of Subsection 105.01. Stockpile sites shall be at locations as SHOWN ON THE DRAWINGS or approved by the Engineer.

Clearing and grubbing of stockpile sites, if required, shall be in accordance with Section 201.

304.12
Thickness
Requirements

The thickness of the compacted nominal aggregate shall not vary more than 1/2 inch for aggregates with a maximum particle size of 1 inch or less, nor more than 1 inch for aggregates with a nominal maximum particle size greater than 1 inch from the thickness SHOWN ON THE DRAWINGS. The compacted thickness shall not be consistently above or below the specified thickness.

304.13
(Reserved)

MEASUREMENT

304.14
Method

The method of measurement as described in Section 106 will be DESIGNATED in the SCHEDULE OF ITEMS.

Aggregate quantities will include mineral filler or binder.

PAYMENT

304.15
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

<u>Pay Item</u>	<u>Pay Unit</u>
304(01) Pit Run Aggregate, Maximum Size _____, Compaction _____	C.Y.
304(02) Pit Run Aggregate, Maximum Size _____, Compaction _____	TON 30 .1
304(03) Pit Run Aggregate, Maximum Size _____, Compaction _____	L.S.
304(04) Grid-Rolled Aggregate, Maximum Size _____, Compaction _____	C.Y.
304(05) Grid-Rolled Aggregate, Maximum Size _____, Compaction _____	TON
304(06) Grid-Rolled Aggregate, Maximum Size _____, Compaction _____	L.S.
304(07) Screened Aggregate, Grading _____, Compaction _____	C.Y.
304(08) Screened Aggregate, Grading _____, Compaction _____	TON
304(09) Screened Aggregate, Grading _____, Compaction _____	L.S.
304(10) Crushed Aggregate, Type _____, Grading _____, Compaction _____ . .	C.Y.
304(11) Crushed Aggregate, Type _____, Grading _____, Compaction _____ . .	TON
304(12) Crushed Aggregate, Type _____, Grading _____, Compaction _____ . .	L.S.

Section 603 - Metal Pipe

DESCRIPTION

603.01
Work This work shall consist of furnishing and installing, or installing only, metal pipe and pipe appurtenances, including all bedding and backfilling required to complete the work. The term metal refers to aluminum, and steel.

MATERIALS

603.02
Requirements Materials shall meet the requirements of the following Subsections:

Flexible Plastic Gaskets	705.09
Corrugated Steel Pipe and Pipe Arches.	707.01
Bituminous-Coated Corrugated Steel Pipe and Pipe Arches	707.02
Polymeric-Precoated Steel Pipe, Pipe Arches, and Underdrains	707.03
Corrugated Aluminum Alloy Culvert Pipe	707.06
Bituminous-Coated Corrugated Aluminum Alloy Culvert Pipe	707.08
Rubber Gaskets	705.03
Aluminum-Coated Type 2 Corrugated Steel Pipe and Pipe Arches	707.13
Aluminum-Zinc Coated Corrugated Steel Pipe and Pipe Arches	707.14
Bituminous-Coated Polymeric-Precoated Steel Pipe, Pipe Arches and Underdrains	707.15

Bedding material shall meet the requirements of Subsection 603.04.

Backfill materials shall meet the requirements of Subsection 603.08.

Damaged spelter coating caused by welding, field cutting, or mishandling shall be cleaned and painted as specified in AASHTO M 36.

End sections shall be constructed of a material meeting the requirements of AASHTO M 218 or AASHTO M 36.

Bituminous-coated end sections shall be coated to meet the requirements of AASHTO M 243 or AASHTO M 190.

The materials used in each pipe installation shall be compatible with each other to prevent electrolysis or physical failure.

Either annular or helical pipe corrugations will be acceptable; and helical corrugated pipe containing annular rerolled ends may be used in conjunction with annular pipe of like or compatible materials.

A fabricators Certification shall be furnished certifying that the sheet and pipe fabrication are in accordance with AASHTO M 36, M 196, and M 245 as applicable. The Certification shall be submitted prior to installation of the pipe.

The lengths and locations of individual pipe SHOWN ON THE DRAWINGS are approximate. Pipe shall not be ordered until culvert locations are DESIGNATED ON THE GROUND and a written list of the correct lengths is issued by the Engineer.

CONSTRUCTION

603.03
Excavation Excavation shall be in accordance with the requirements of Section 206A.

Pipe that is installed in or that will affect streams SHOWN ON THE DRAWINGS as important fisheries shall be installed only during those periods SHOWN ON THE DRAWINGS.

603.04
Bedding

Bedding shall consist of bedding the pipe to a depth of not less than 10 percent of its total height. The foundation surface, after excavation in accordance with Subsection 206A.03 (b), shall be compacted in accordance with Subsection 603.08 and shaped to fit the pipe.

The bedding material shall be selected mineral soil meeting the requirements for backfill in Subsection 603.08. The completed bedding shall have a longitudinal camber when SHOWN ON THE DRAWINGS.

603.05
Laying Pipe

The lower segment of the pipe shall be in contact with the bedding for the required depth throughout its entire full length. Outside circumferential laps shall be placed facing upstream.

Paved or partially lined pipe shall be laid so the longitudinal centerline of the paved segment coincides with the flowline. Elliptical pipe shall be placed with the major axis within 5 degrees of a vertical plane through the longitudinal axis of the pipe.

The final installed alignment shall be such that no reverse grades exist and no point shall vary from a straight line drawn from inlet to outlet by more than 2 percent horizontally and vertically of the culvert length or 1 foot, whichever is less, unless otherwise SHOWN ON THE DRAWINGS.

No pipe shall be placed in service until a suitable outlet is provided.

Helically corrugated lock-seam pipe shall be installed with the seam at the inlet end placed below the horizontal centerline. This requirement applies to the outlet end when the outlet is less than 5 feet below subgrade.

Longitudinal laps on riveted or spot-welded pipe shall be positioned at any location between 45 degrees above or below horizontal.

603.06
Joining Pipes

Pipe shall be firmly joined by form-fitting coupling bands. End sections shall be attached to pipe by connecting bands or other means as recommended by the manufacturer. Gaskets shall be installed at each joint to form a watertight connection when SHOWN ON THE DRAWINGS. Dimpled bands shall not be used when the slope of the pipe is greater than 15 percent.

The coupling bands shall meet the strength requirements of field joints for Non-Erodible Soil Condition--Special Joint Type according to Division II, Section 23 of the "Standard Specifications for Highway Bridges" by AASHTO.

603.07
Shop Elongation

When SHOWN ON THE DRAWINGS, the vertical diameter of round pipe shall be increased 5 percent by shop elongation.

603.08
Backfilling

Pipe meeting any of the following conditions shall not be placed or backfilled until the excavation and foundation have been approved by the Engineer:

- (a) Embankment height greater than 10 feet at subgrade centerline.
- (b) Installation in a live stream.
- (c) Round pipe with a diameter of 48 inches or greater.
- (d) Pipe arches with a span of 50 inches or greater.

After the bedding is prepared and the pipe is placed, selected material shall be placed in layers not exceeding 6 inches loose thickness and compacted under the haunches and alongside the pipe. The material shall be readily compactible material free of frozen lumps, chunks of highly plastic clay (Plasticity Index greater than 10), or other objectionable material. Rocks larger than 3 inches in greatest dimension shall not be used within 1 foot of the pipe. On each side of the pipe there shall be an area of compacted material at least as wide as one diameter of the pipe. Backfill shall be compacted without damaging or displacing the pipe. The density shall be Method A or B as shown in the SCHEDULE OF ITEMS.

Method A. Backfill density shall exceed the density of the surrounding embankment.

Method B. Backfill density shall exceed 95 percent of the maximum density as determined by AASHTO T 99-Method C or D.

Backfilling and compacting shall be continued until the backfill is a minimum of 12 inches above the top of the culvert.

After being bedded and backfilled, pipe shall be protected by an adequate cover of embankment before heavy equipment is permitted to cross during roadway construction.

Pipe distorted more than 5 percent of nominal dimensions, ruptured, or broken shall be replaced.

603.09
(Reserved)

MEASUREMENT

603.10
Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

When shown in the SCHEDULE OF ITEMS, backfill material adjacent to the pipe will be measured 1 foot horizontally and vertically from the outside dimensions of the pipe with a deduction for the volume of the pipe along the full length of the backfill.

~~PAYMENT~~

~~603.11
Basis~~

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will made under:

<u>Pay Item</u>	<u>Pay Unit</u>
603(01) -Inch Corrugated Metal Pipe, -Inch Thickness for Steel or -Inch Thickness for Aluminum, Method 	L.F.
603(02) -Inch Span, -Inch Rise, Corrugated Metal Pipe Arch, -Inch Thickness for Steel, or -Inch Thickness for Aluminum, Method 	L.F.
603(03) -Inch Metal End Section	EA.
603(04) -Inch Span, -Inch Rise Metal End Section	EA.
603(05) -Inch Corrugated Steel Pipe, -Inch Thickness, Method 	L.F.
603(06) -Inch Span, -Inch Rise, Corrugated Steel Pipe Arch, -Inch Thickness, Method 	L.F.

Section 625 - Seeding & Mulching

DESCRIPTION

625.01 This work shall consist of preparing seedbeds and furnishing and
Work placing required seed, fertilizer, limestone, mulch, and net and
blanket material.

MATERIALS

625.02 Materials shall meet the requirements of the following Subsections:
Requirements

Agricultural Limestone	713.02
Fertilizer	713.03
Seed	713.04
Mulch	713.05
Net and Blanket Material	713.07
Water	713.08(a)

Tackifier shall be emulsified asphalt Grade SS-1, SS-1h, CSS-1 or
as specified in the SPECIAL PROJECT SPECIFICATIONS.

CONSTRUCTION

625.03 The normal seasonal dates for seeding shall be as specified in the
Seeding Seasons SPECIAL PROJECT SPECIFICATIONS. Seeding materials shall not be
applied during windy weather or when the ground is excessively wet
or frozen. Work shall be performed during each specified seeding
season on all completed and previously untreated sections.

625.04 The areas to be seeded shall be finished as required by other
Soil Preparation applicable Sections to the lines and grades SHOWN ON THE
DRAWINGS. Areas that are damaged by erosion or other causes shall
be restored. The surface soil shall be in a roughened condition
favorable for germination and growth. Limestone, when required,
shall be applied uniformly either prior to or after soil
preparation at the rate specified in the SPECIAL PROJECT
SPECIFICATIONS.

625.05 Material may be placed by the following methods:

Application
Methods for Seed, (a) Hydraulic Method. The seed or seed and fertilizer shall be
Fertilizer, mixed with water in the amounts and mixtures specified in the
& Limestone SPECIAL PROJECT SPECIFICATIONS to produce a slurry and then
applied under pressure at the rates specified in the SPECIAL
PROJECT SPECIFICATIONS. When wood cellulose or grass straw mulch
materials are to be incorporated as an integral part of the slurry
mix, they shall be added after all other materials have been
thoroughly mixed in the tank. 625 .05

Legume seed shall be inoculated with approved cultures in
accordance with instructions of the manufacturer. The inoculum
used for hydraulic seeding shall be four times that recommended
for dry seeding.

(b) Dry Method. Mechanical seeders, seed drills, landscape
seeders, cultipacker seeders, fertilizer spreaders, or other
approved mechanical seeding equipment shall be used to apply the
seed or seed and fertilizer in the amounts and mixtures specified
in the SPECIAL PROJECT SPECIFICATIONS.

Fertilizer in dry form and ground limestone shall be spread
separately at the rates specified in the SPECIAL PROJECT
SPECIFICATIONS and incorporated in one operation to the required
depth on those areas SHOWN ON THE DRAWINGS.

Hand-operated seeding devices may be used when seed, fertilizer,
and ground limestone are applied in dry form.

625.06

Application of
Mulch

(a) Hydraulic Method. Wood cellulose or grass straw fiber mulch and fertilizer may be applied in one operation by means of hydraulic equipment that uses water as the carrying agent. A continuous agitator action that keeps the materials in uniform suspension must be maintained throughout the distribution cycle. The discharge line shall provide an even distribution of the solution to the seedbed. Mulching shall not be done in the presence of free surface water. Application to areas SHOWN ON THE DRAWINGS shall start at the top of the slope and work downward. If necessary, the use of extension hoses may be required to reach the extremities of slopes. The rate of application shall be as specified in the SPECIAL PROJECT SPECIFICATIONS.

(b) Dry Method. Mulch shall be applied after seeding and fertilizing are completed, unless otherwise specified in the SPECIAL PROJECT SPECIFICATIONS. The mulch shall be applied uniformly at the rate specified in the SPECIAL PROJECT SPECIFICATIONS.

When a binder is to be used for mulch, the material shall be applied at the rate specified in the SPECIAL PROJECT SPECIFICATIONS. It shall be immediately distributed evenly over the mulch. The contractor shall prevent asphalt adhesive materials from marking or defacing structures, appurtenances, pavements, utilities, or plant growth.

625.07

(Reserved)

625.08

Installation of
Netting & Erosion
Control Blankets

Nettings and erosion control blankets shall be installed as SHOWN ON THE DRAWINGS and in accordance with the manufacturer's recommendations.

625.09

Care During
Construction

The contractor shall be responsible for protecting and caring for seeded areas until final acceptance of the work. The contractor shall repair all damage to seeded areas caused by his construction operations without additional compensation.

MEASUREMENT

625.10

Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Area computations will be upon surface measurements.

PAYMENT

625

.06

625.11
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
625(01) Seeding, Hydraulic Method (without mulch)	ACRE
625(02) Seeding, Hydraulic Method (without mulch)	M.S.F.
625(03) Seeding, Hydraulic Method (with mulch)	ACRE
625(04) Seeding, Hydraulic Method (with mulch)	M.S.F.
625(05) Seeding, Dry Method (without mulch)	ACRE
625(06) Seeding, Dry Method (without mulch)	M.S.F.
625(07) Seeding, Dry Method (with mulch)	ACRE

Section 306 - Reconditioning Existing Road

DESCRIPTION

306.01

This work shall consist of reconditioning the traveled way and shoulders of an existing road; cleaning ditches and culverts, including inlets and outlets; removing slide material; scarifying and shaping the traveled way and shoulders, parking areas, turnouts, and approach road connections.

CONSTRUCTION

306.02

Performance

The traveled way and shoulders shall be scarified and shaped at locations and to the depth and width SHOWN ON THE DRAWINGS. Any rock larger than 4 inches in its greatest dimension brought to the surface during scarification shall be removed, except as provided below.

When a base or surface course is required, provisions of (a) or (b) shall apply:

(a) Rocks larger than 4 inches that do not protrude above the existing surface or the subgrade more than one-third of the depth of the base or surface course or 3 inches, whichever is less, may be left in place.

(b) Rocks with exposed surface area exceeding 2 square feet shall be removed to at least 6 inches below subgrade.

Excess materials removed shall be disposed of in areas SHOWN ON THE DRAWINGS.

Existing bituminous surfaces, SHOWN ON THE DRAWINGS, shall be scarified and pulverized until all lumps are reduced to the maximum size SHOWN ON THE DRAWINGS. The bituminous pulverized aggregate shall be incorporated into the traveled way and shoulders.

The traveled way and shoulders of intersecting roads shall be similarly treated to provide a smooth transition for the distance SHOWN ON THE DRAWINGS.

The ditches shall be graded to the typical sections and at the locations SHOWN ON THE DRAWINGS. Culverts shall be cleaned to drain.

Excess and unsuitable materials removed from the roadbed, slides, culverts, and ditches shall be disposed of as SHOWN ON THE DRAWINGS.

The traveled way and shoulders shall be shaped after scarification and compacted by one of the following, as shown in the SCHEDULE OF ITEMS.

Compaction A. By operating equipment over full width.

Compaction B. 95 percent of AASHTO T 99, Method C or D.

Compaction C. 95 percent of AASHTO T 180, Method C or D.

Compaction D. Subsection 203.15, Method 3

When compaction B or C is specified, the in-place density of the material shall be determined in accordance with AASHTO T 191, T 205, or T 238; T 217, T 239, or T 255; and T 224.

306.03
(Reserved)

306
.03

Section 640 - Road Closure Devices

DESCRIPTION

640.01
Work

This work shall consist of furnishing and installing, or installing only, road closure devices using fabricated gates and accessories, combination post and rail barriers, concrete barriers, and earth mound barriers.

MATERIALS

640.02
Requirements

Materials to be used in fabricating gates and barriers shall be as SHOWN ON THE DRAWINGS.

Metal beam elements, steel posts, structural steel and steel pipe shall meet the requirements SHOWN ON THE DRAWINGS.

All hardware shall be galvanized in accordance with AASHTO M 232 and shall meet the requirements of ASTM A 307. Plain or cut washers shall be American Standard Washers.

Timber posts, rails and lumber shall meet the requirements of AASHTO M 168. The timber specie and type and rate of preservative treatment shall be as SHOWN ON THE DRAWINGS.

Concrete shall meet the requirements of Section 602, Method B or C as SHOWN ON THE DRAWINGS.

Earth mound barriers shall be constructed as SHOWN ON THE DRAWINGS from excavated material adjacent to the barrier location or from other locations as SHOWN ON THE DRAWINGS.

CONSTRUCTION

640.03
Performance

Road closure devices shall be placed at the location SHOWN ON THE DRAWINGS. All devices shall be constructed to the dimensions SHOWN ON THE DRAWINGS.

Welding required in assembling gates shall be done in accordance with the best modern practice and the applicable requirements of AWS D1.1.

After assembly, nongalvanized steel pipe gates shall be cleaned and painted with one coat of zinc-rich primer and two coats of exterior enamel of the type and color SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

All posts shall be set vertically and embedded to the depth SHOWN ON THE DRAWINGS. Concrete for embedment shall be placed against undisturbed earth within an excavation sized to achieve the embedment dimensions. Backfill shall be compacted in 6-inch layers to finished grade.

All signs and/or reflective warning markers accessory to the road closure device as SHOWN ON THE DRAWINGS shall be furnished and installed by the contractor.

MEASUREMENT

640.04
Method

The method of measurement, described in Section 106, will be designated in the SCHEDULE OF ITEMS.

Installation of signs and/or markers shall be considered incidental to other pay items and additional payment will not be made.

PAYMENT

640.05
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

SECTION 400 SNOW REMOVAL

400.01 This work shall consist of the removal of snow from roads used by the permittee, when required.

400.02 SNOW REMOVAL. Snow shall be removed from the roads daily if necessary to assist in safe travel and to help eliminate road damage during snow melting periods. Snow removal by cleated vehicles will be permitted on unpaved roads. When snow removal is performed with cleated vehicles, 2" of snow cushion shall be left on the road to protect the road surface unless the surface of the road is frozen. Snow left on the road for cushioning shall be bladed off using a rubber tired snow removal equipment so that the road surface is left in a near bare condition.

Snow shall be bladed beyond the ditch line where possible. On dugway sections, snow can be pulled from the ~~6~~ outside and deposited over the fill side, making certain that the ditch is clear for water to pass down the ditch.

Snow removal along through cuts or turnpike sections shall be bladed outside of the ditch section by winging the snow out. In areas where the melting snow will be trapped between snow banks, occasional cut out ditches will be bladed out, not to exceed 300' (feet) by plowing a hole out through the snow bank so that trapped water may escape the roadway prism.

Collection of snow on the road surface will not be allowed. Scarification or salting the road surface may be required to eliminate snow build up on the road surface.

United States Forest
Department of Service
Agriculture

Ashley National Forest
Duchesne Ranger District
P.O. Box I
Duchesne, Utah 84021

Reply To: 2820

Date: August 2, 1991

Global Natural Resources Corp.
Attn: Kendal Kuiper
5300 Memorial Drive, Suite 800
Houston, TX 77007

RE: Timber Canyon #17-1
SE1/4SE1/4, Section 17, T. 5 S., R. 9 W., USB&M, Wasatch County,
Utah
Lease # U-48776, Timber Canyon Unit

Dear Mr. Kuiper,

On July 19, an onsite meeting was held for the above referenced well.
Those in attendance were as follows:

Mark Dolar	Contract Landman
Joseph Bistryski	Forest Service, District Ranger
Darlene Johnson	Forest Service, Soils Scientist
Thomas Watson	Forest Service, Engineer
Barry Burkhardt	Forest Service, Geologist
Tim O'Brian	BLM, Natural Resource Protections

Specialists:

Jerry Kenozka	BLM, Petroleum Engineer
Clay Perchon	Utah Department of Wildlife Resources

The following items were discussed and agreed to at the onsite meeting:

1. The enclosed Forest Service stipulations for Federal Surface/Federal Minerals shall apply and shall be included with the APD/Surface Use Plan.
3. Access is planned as indicated on the enclosed map. The enclosed Road Data Sheet indicates road standard and design considerations and is to be included with the APD/Surface Use Plan as Exhibit B.

Should you have any questions, please contact Barry Burkhardt,
Wasatch-Cache National Forest office (phone 801-524-5030) or me in
Duchesne (phone 801-738-2482).

Sincerely,

Joseph R. Bistriski
JOSEPH R. BISTRYSKI
District Ranger

cc: Mark Dolar
BLM, Vernal District
B.Burkhardt, Wasatch-Cache NF
Forest Supervisor, Ashley NF

BLM, Vernal District
B. Burkhardt, Wasatch-Cache NF
Forest Supervisor, Ashley NF

DATE: 7/23/91

FOREST SERVICE STANDARD STIPULATIONS
FOR FEDERAL SURFACE AND FEDERAL MINERALS

Operator Name and Well No.: Global Timber Canyon # 17-1

Legal Description: T. 5. S., R. 9 W., USB&M
Section 17: SE1/4SE1/4

CONSTRUCTION

1. Single-lane access roads will be constructed and maintained according to a Forest Service typical profile and specification as indicated on the attached Exhibit A (General Road Construction and Rehabilitation Specifications), and Exhibit B (Standard Construction and Maintenance Specifications, and Road Data Sheet). The access road shall be accepted by the Forest Service prior to moving equipment onto location.

In the event that construction activity occurs during winter conditions, the construction and maintenance (such as snow removal) requirements may be modified to provide access and minimize environmental damage. In those cases where the project is modified for winter time access, the road will be completed to final standards within the next six months.

2. The widening of corners, grading, and installation of drainage structures on the access road to this well shall be approved by the Forest Service Engineering Section prior to construction. The access road shall be accepted by the Forest Service prior to moving equipment onto the location. The permanent access road(s) will be constructed and maintained according to Forest Service approved specifications as indicated on the attached Exhibit A (General Road Construction and Rehabilitation Specifications), and Exhibit B (Standard Construction and Maintenance Specifications, and Road Data Sheet).
3. A prework conference shall be held prior to any earth disturbing activities and a starting date established. This will include, at minimum, the operator or his authorized representative, the dirt contractor, and the authorized Forest Service officer. The lead operator is responsible for scheduling and holding this meeting in a timely manner sufficient for resolving any potential problems prior to actual construction.

The Forest Service shall be notified in the event the established starting date is changed. The Forest Service will then determine if another prework conference is necessary.

4. The operator will provide the dirt contractor with a copy of Forest Service standard specifications for Construction of Roads and Bridges (EM-7720-100) (see Exhibit B) along with everything referenced in Stipulation 1 or 2, whichever is applicable. Construction operations may be suspended if the contractor fails to have these documents on site.
 5. The operator will be responsible for maintenance of cattleguards, or replacement of cattleguards damaged as a result of the oil and gas operation. The operator is also responsible for any necessary warning signs and for the maintaining culverts.
- Due to the potential off-site impacts of the access road across lands other than those within the National Forest System, the operator will notify and comply with stipulations provided by said land owners.
6. If, prior to or during construction, items of archaeological, paleontological, or historic value are reported or discovered, or an unknown deposit of such items is disturbed, the operator will immediately cease construction in the affected area and notify the Forest Service. Construction will not resume until approval is given by the Forest Service.
 7. The operator shall protect, in place, all public land survey monuments, private property corners, and Forest Service boundary markers. In the event that any such land markers or monuments are destroyed in the exercise of their rights, depending on the type of monument destroyed, the operator shall see that they are reestablished or referenced in accordance with (1) the procedures outlined in the "Manual of Instructions for the Survey of the Public Land of the United States", (2) the specifications of the county surveyor, or (3) the specifications of the Forest Service.
 8. No surfacing material or gravel will be taken from Forest Service lands unless approved by the District Ranger in writing.
 9. A reserve pit liner will be required. The liner will have a burst strength of not less than 140 psi. If the reserve pit is excavated through sand, fractured rock or gravel, the liner will have a burst strength of not less than 200 psi. The drill site will be constructed so all surface runoff from the site drains into the reserve pit. No trash will be disposed of in the reserve pit.
 10. The operator will contact the Forest Service when the construction activity is completed. The Forest Service will then make a final inspection and document its acceptance or will identify the specific items which do not meet acceptable standards.

DRILLING OPERATIONS

11. The reserve pit will be fenced on three non-working sides during drilling. After drilling is completed, the fourth side of the pit will be fenced until the pit is reclaimed.

The entire disturbed location will be fenced after seeding. Fences and cattleguards must meet Forest Service specifications. Once the location has been rehabilitated and vegetation re-established, the fence will be removed or the fenced area reduced as required by the Forest Service.

12. Production water or testing tanks shall be located and/or diked so that any spilled fluids will flow into the reserve pit. Production water tanks will not be placed on topsoil stockpiles.
13. Portable dumpsters or cage will be used for all trash. All trash will be hauled off site, no burning will be allowed.
14. Sewage will be disposed of according to county and state requirements, and a portable chemical toilet will be used on site.

PRODUCTION FACILITIES

15. If a tank battery is constructed, each and every tank setting, treater, and separator must be surrounded on all four sides by an impermeable dike/berm of sufficient capacity to adequately contain the contents of the largest vessel within the dike plus one day's production. Load lines must terminate within the dike.
16. All vent lines must terminate within the diked area or be designed so that no liquids can flow out of the vent lines.
17. All internal combustion engines associated with production facilities will be equipped with noise-reducing mufflers.
18. All above-ground facilities will be painted earthtone color (Munsell Soil Color 5Y 6/3) Sand Beige within six months of the well completion.
19. The operator must maintain vegetative control on the area of operation including a 30 foot minimum bare ground area around any source of open fire. The operator shall maintain the area to be cleared by means of chemicals only after the Forest Supervisor has given specific written approval. Application for such approval must be in writing and must specify the time, method, chemicals, and the exact portion of the area to be chemically treated.
20. No permanent above ground pipelines will be approved between the well head and treater or between the treater and flare pit.
21. All spills (production water or oil) or pipeline breaks outside the diked area shall be reported within 24 hours to the Forest Service and to the appropriate state agencies..

REHABILITATION

A PREWORK BETWEEN THE FOREST SERVICE AND THE OIL COMPANY/CONTRACTOR IS REQUIRED FOR ALL PHASES OF SITE REHABILITATION.

22. Upon completion of drilling, fluids in the pit will be pumped out to the extent practical and disposed of in an approved disposal facility. The operator will provide the Forest Service with a chemical analysis of the remaining muds. The method of pit closure will then be determined by the Forest Service based on the results of this analysis.
23. If this well is a producer, those portions of the drill site not needed for production shall be rehabilitated within six months. In the event of winter freeze-up, reclamation will be put on hold as determined by the Forest Service.
24. If this well is a non-producer, the entire location and access road will be rehabilitated within six months from the date the well is plugged.
25. If this well is temporarily abandoned after drilling, rehabilitation will be completed within six months according to the specifications set forth in stipulation numbers 22 and 23 above unless approved otherwise in writing by the District Ranger.
26. At such time as the well is abandoned, the operator is required to identify the well location with the appropriate information. Said information will be placed on a flat plate, or survey marker, attached to the well casing so that the marker is buried from two to six feet below the recontoured surface. The plate/marker sealing the casing is required to have a "weep hole" (1/8" - 1/4") which will allow pressure to dissipate and facilitate detection of any fluid seepage.
27. Seed mixtures to be used in rehabilitating this site will be provided by the Forest Service. Seeding will be accomplished during the spring or fall seeding period as directed by the Forest Service. (Fall is considered to be best).

SEED MIX TIMBER CANYON DRILL SITE

SPECIES	AMOUNT (Pounds)	Percent
Fairway crested wheatgrass	2	17.4
Intermediate wheatgrass	1	8.6
Paiute orchardgrass	2	17.4
Hard fescue	1.5	13.0
Ladak alfalfa	1.5	13.0
Lewis flax	1	8.6
Rincon fourwing saltbush	1	8.6

Forage kochia

1.5
11.5 lbs.

13.0
99.6

The operator will be responsible for control or elimination of any noxious weeds associated with this well site until vegetative cover is re-established.

OTHER STIPULATIONS

28. The following modifications were agreed upon at the on-site inspection and are included as part of the stipulations for the construction of this well location:

a) Rock or structures will be placed in the re-routed drainage to reduce water velocity and potential erosion.

The channel capacity of the rerouted drainage should duplicate or exceed the existing channel. Some meanders should be added along with rock in the bottom of the new channel. The objective is to reduce velocities of the water thereby reducing sediment load to Timber Canyon Creek.

A drainage ditch will be cut between the well pad and existing road to catch runoff from the side of the well pad.

b) If water for drilling is pumped from the creek, a small mesh screen will be placed over the intake of the pipe and rocks piled around the intake. The operator must check with the State concerning water rights and approval to use the creek as a water source.

c) The amount of cut at the wellbore is to be reduced to five (5) feet, which will raise the pad elevation by 1.2 feet.

d) The doghouse side of the pad will be reduced to 90-100 feet to eliminate the need to relocate the existing road.

e) The corners of the pad on the doghouse side (stakes 2 & 8 on the location layout plat) are to be rounded to reduce the amount of fill and help eliminate the need to relocate existing road.

f) The corner of the reserve pit (stake B on plat) will be rounded to reduce the amount of cut into the hillside.

g) The material from excavation of the reserve pit will be placed around the proposed flare pit and or between the reserve pit and flare pit.

h) Access onto the drill pad will be on the V-door end of the pad.

EXHIBIT A

GENERAL ROAD CONSTRUCTION, MAINTENANCE AND REHABILITATION SPECIFICATIONS

1. Advance Preparation and Cleanup. After grading is completed and before applying revegetation measures, areas to be revegetated shall be raked or otherwise cleared of sticks, stumps, stones larger than two inches in diameter, and other debris which might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes occurs after the completion of grading and before beginning the revegetation work, the lead operator/holder shall repair such damages. This shall include filling gullies, smoothing irregularities, and repairing other incidental damage. Immediately in advance of the seeding, any crusted surface shall be scarified at right angles to the slope plane.
2. If the road is to be obliterated following termination, the following procedures may be initiated. Site specific requirements may be designated by the Forest Service.
 - A. Placement of the road surface back to natural ground line and topsoil evenly spread.
 - B. Seeding of the road surface to the grass mixture as prescribed by the District Ranger.
 - C. Removal of culverts used for cross drains.
3. Topsoil shall be stripped where disturbance will occur and be deposited in a windrow apart from other excavated material. After the desired amount of material has been removed, and the resulting slopes and ditches have been shaped and smoothed as required, the stored topsoil shall be evenly spread over exposed subsoil to the extent that may be practicable, and shall be revegetated. All earth cut or fill slopes favorable to vegetation or other areas on which ground cover is destroyed in the course of construction, reconstruction, or heavy maintenance, will be revegetated with a seed mix approved by the Forest Service.
4. Seed mixtures shall be certified weed free. A certified copy shall be supplied to the Forest Service prior to planting. Seed mixes shall be used as designated in stipulation #27.
5. Seeding or planting of grasses will only be done upon the approval of, and in a manner which the District Ranger considers the best chance of success. Seeding or planting will be repeated until satisfactorily revegetated and stabilized. Shrubs and trees, if required, will be

planted as early as possible in the spring, or after they become dormant in the fall.

10/90

STIPULATIONS

Exhibit B1

EM-7720-100 Standard Construction Specifications

The checked reference sections are the construction and maintenance specifications that will apply to this permit.

- ☒ 101 Abbreviations
- ☒ 102 Definitions
- ☒ 103 Intent of Permit
- ☒ 104 Maintenance of Traffic
- ☒ 170 Construction Staking
- ☒ 201 Clearing and Grubbing, Slash Treatment-Method-bury or remove and dispose
- ☐ 202 Removing of Structures and Obstructions
- ☒ 203 Excavation and Embankment, Embankment Placing Method 2
- ☒ 206A Excavation for Culverts and Minor Structures
- ☐ 210 Obliteration of Abandoned Roadways
- ☒ 211 Roadside Cleanup
- ☒ 304 Aggregate Base of Surface Course
- ☐ 412 Bituminous Dust Palliative Treatment
- ☒ 603 Metal Pipe
- ☒ 607 Fences, Gates and Cattleguards
- ☐ 611 Development of Pits and Quarries
- ☐ 617 Structural-Plate Pipe, Pipe Arches and Arches
- ☐ 619 Riprap
- ☐ 621 Corrugated Metal Spillways and Downdrains
- ☒ 624 Top Soiling
- ☒ 625 Seeding and Mulching
- ☐ 626 Trees, Shrubs, Vines and Ground Cover
- ☐ 628 Sprigging
- ☐ 632 Sign Installation
- ☐ 633 Traffic Control Signs
- ☐ 713 Roadside Improvement Materials
- ☐ 719 Flexible Downpipe
- ☐ 720 Woven Plastic Filter Cloth

Uniform Specifications for Road Maintenance

- ☒ 0-101 Surface Blading
- ☐ 0-103 Dust Abatement
- ☒ 0-105 Slide Repair
- ☒ 0-113 Surfacing Repair
- ☒ 0-201 Shoulder Maintenance
- ☒ 0-301 Ditch Cleaning
- ☒ 0-310 Minor Drainage Structures
- ☒ 0-507 Roadside Vegetation

<u>X</u>	0-618	Major Drainage Structures - Low water crossing.
<u>X</u>	0-619	Miscellaneous Structures
<u>X</u>	0-710	Traffic Services
<u>X</u>	0-807	Snow Removal

1/86

EXHIBIT B2
ROAD DATA

Date: _____

Design Speed: 15 mph X 35 mph _____ Design Class: Local X Collector _____

Type of alignment: Geometric _____

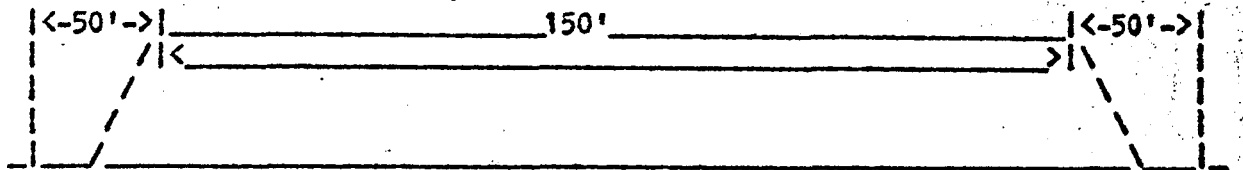
Driveable flag line with field review and approval by the Forest Service _____

Type of Plans: Forest Service standard set _____ Other _____ (describe below)

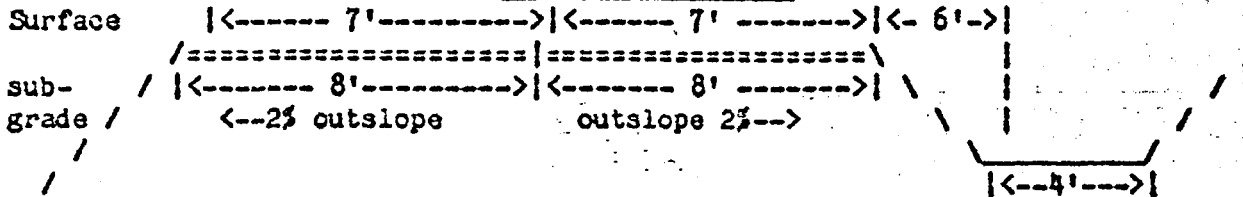
Cross sections required: Yes _____ No _____

For entire project _____ Only segments _____ Describe _____

Turnout spacing: 1000' max. _____ Intervisible _____
Intervisible with 1000' max. spacing _____



TURNOUT DIMENSIONS



ROADWAY TEMPLATE

NOTE: See standard set of plans for slopes and fill widening.
Method of embankment placement (spec.203), will be method 2 with a sheepfoot.

Surfacing depth: Single lane road 4" _____ Double lane road 6" _____

Construction tolerance class: E _____ F _____

Major drainage site work and plans required: Yes _____ No _____

If yes: Location of site _____

PERSONNEL PRESENT AT MEETING

Company Rep. _____ USFS Rep. _____

Well Name and No. Timber Canyon #17-1 Lease No. U-48776

Road No. #10149 FDR Y (Y/N) Special Use Road N (Y/N)

Well Location: SE 1/4 SE 1/4 Section 17, Township 5 South, Range 9 West,
USB&M.

10/90

STIPULATIONS

EXHIBIT C

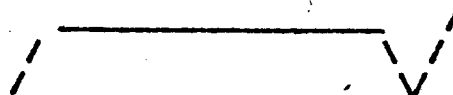
TEMPORARY ROAD GUIDELINES FOR OIL AND GAS DEVELOPMENT

Where suitable terrain exists and has been approved by the appropriate Forest Officer, industry may have its choice of either a temporary or permanent construction standard during the drilling phase of well development under the following conditions.

TYPICAL SECTION FOR TEMPORARY ROAD CONSTRUCTION

24' Maximum Travelway

1.5:1 Fillslopes



1:1 Backslopes

Ditch Detail

1. If production is established, the road shall be surveyed, designed and constructed (as per Exhibit B) within 45 days after the completion of the well. The holder shall notify the Forest Service when production is established. If a dry hole, additional erosion measures may be required within 30 days pending final rehabilitation. If weather does not allow construction, it shall be completed by the date set by the District Ranger (for winter weather this is generally July 1 of the following year).
2. The temporary road may have a maximum disturbed width of 30 feet and will be ditched as appropriate to provide drainage. Crossdrains may be needed in some areas to reduce ditch erosion. Any slash shall be treated as directed by the District Ranger. Complete or spot surfacing may be used, provided it is removed if the road is rehabilitated.
3. The road centerline shall be located (flagged) prior to construction.
4. All topsoil shall be removed and stockpiled as directed by the Forest Service.
5. Grade pitches of 15% for up to 300 feet may be used, provided adequate erosion control measures are taken and the grade can be reduced to 10% or less during final construction.
6. The temporary travelway may require definition by ditches, fencing, or signing to keep all travel within the approved corridor. Approaches will be provided where needed.

7. Drainage structures shall be placed in all natural drainage ways and major drainages will have the permanent structure designed and approved before the permit is issued. A temporary crossing, if used, will be designed to pass a ten-year storm.
8. The road will be signed "CLOSED TO PUBLIC TRAVEL". Any exceptions must be approved by the District Ranger.
9. A temporary cattleguard may be used when crossing fencelines and be replaced with one meeting the HS-20 requirement when and if the road is constructed to a permanent standard.
10. The holder understands that severe weather may necessitate a temporary road closure by the District Ranger and should be prepared to have an alternative means for supplying the rig if a period of excessive rutting occurs. No berming or windrowing of wet soil from the travelway will be allowed.

2/5/86

OPERATOR Global Natural Resource DATE 4-7-90
WELL NAME Timber Canyon 17-1
SEC SESE 17 T 55 R 9W COUNTY Wasatch

43-051-30017
API NUMBER

Leasehold (1)
TYPE OF LEASE

CHECK OFF:

- | | | |
|---|--|---|
| <input checked="" type="checkbox"/> PLAT. | <input checked="" type="checkbox"/> BOND | <input checked="" type="checkbox"/> NEAREST WELL |
| <input checked="" type="checkbox"/> LEASE | <input checked="" type="checkbox"/> FIELD USBM | <input checked="" type="checkbox"/> POTASH OR OIL SHALE |

PROCESSING COMMENTS:

Included in POD as obligation well.
Water Permit
ROCE 4-7-90
Well was approved by BLM 3-24-90 before
we even mailed copy of APD from operator.

APPROVAL LETTER:

SPACING: ☒ RWA-3 R615-2-3 Timber Canyon ☐ R515-3-2
UNIT
☐ N/A ☐ R615-3-3
CAUSE NO. & DATE

STIPULATIONS:

1- Needs water permit



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangarter

Governor

Dee C. Hansen

Executive Director

Dianne R. Nielson, Ph.D.

Division Director

355 West North Temple

3 Triad Center, Suite 350

Salt Lake City, Utah 84180-1203

801-538-5340

April 13, 1992

Global Natural Resources Corporation
of Nevada

5300 Memorial Drive, Suite 800
Houston, Texas 77007

Gentlemen:

Re: Timber Canyon 17-1 Well, 1005 feet from the south line, 109 feet from the east line, SE 1/4 SE 1/4, Section 17, Township 5 South, Range 9 West, Wasatch County, Utah

Pursuant to Utah Code Ann. § 40-6-18, (1953, as amended), Utah Admin. R. 649-2-3 (formerly R. 615-2-3), and Utah R. 649-3-4 (formerly R. 615-3-4), approval to drill the referenced well is hereby granted.

In addition, the following specific actions are necessary to fully comply with this approval:

1. Submittal to the Division of evidence providing assurance of an adequate and approved supply of water as required by Utah Code Ann. § 73-3, Appropriations, prior to commencing drilling operations.
2. Compliance with the requirements of Utah Admin. R. 649-1 et seq. (formerly R. 615-1 et seq.), Oil and Gas Conservation General Rules.
3. Notification within 24 hours after drilling operations commence.
4. Submittal of Entity Action Form, Form 6, within five working days following commencement of drilling operations and whenever a change in operations or interests necessitates an entity status change.
5. Submittal of the Report of Water Encountered During Drilling, Form 7.

Page 2
Global Natural Resources Corporation
of Nevada
Timber Canyon 17-1 Well
April 13, 1992

6. Prompt notification prior to commencing operations, if necessary, to plug and abandon the well. Notify Frank R. Matthews, Petroleum Engineer, (Office) (801)538-5340, (Home) (801)476-8613, or R.J. Firth, Associate Director, (Home) (801)571-6068.
7. Compliance with the requirements of Utah Admin. R. 649-3-20 (formerly R. 615-3-20), Gas Flaring or Venting, if the well is completed for production.

Prior to commencement of the proposed drilling operations, plans for facilities for disposal of sanitary wastes at the drill site should be submitted to the local health department. These drilling operations and any subsequent well operations should be conducted in accordance with applicable state and local health department regulations. A list of local health departments and copies of applicable regulations are available from the Department of Environmental Quality, Division of Drinking Water/Sanitation, telephone (801)538-6159.

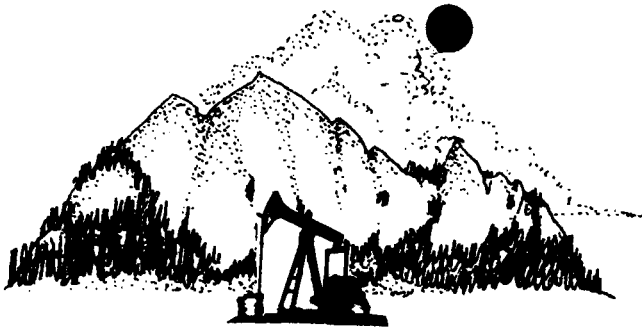
This approval shall expire one year after date of issuance unless substantial and continuous operation is underway or a request for an extension is made prior to the approval expiration date. The API number assigned to this well is 43-051-30017.

Sincerely,



R.J. Firth
Associate Director, Oil and Gas

ldc
Enclosures
cc: Bureau of Land Management
J.L. Thompson
WO11



DOLAR OIL PROPERTIES

9035 South 700 East, Suite 100A
Sandy, UT 84070-2418
(801) 561 - 3121

July 1, 1992

Mr. Frank Matthews
Division of Oil & Gas
3 Triad Center, Suite 350
Salt Lake City, UT. 84180-1203

Mr. Ed Forsman
Bureau of Land Management Office
170 So. 500 E.
Vernal, UT. 84078

Mr. Joe Bistrski
Ashley National Forest
Duchesne Ranger District
P. O. Box 1
Duchesne, UT. 84021

RECEIVED

JUL 06 1992

DIVISION OF
OIL GAS & MINING

RE: Well No. 17-1 **43-051-30017**
Township 5 South; Range 9 West
Section 17: SE/4SE/4
Wasatch County, Utah

Gentlemen:

Please be advised that Global Natural Resources Corporation of Nevada has decided not to pursue the drilling of the above referenced well. The decision is based primarily upon the change in business decisions for the Rocky Mountain region by Global Natural Resources; and the death of one of the partners in the proposed Timber Canyon Unit and 17-1 Well.

- It is disappointing when plans are made and the involvement of several individuals and agencies are included to receive approval for the application to drill and then plans are not followed through. I would like to take this opportunity to thank you for your time,

RE: Well No. 17-1

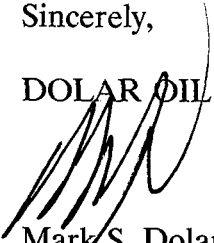
7/1/92

Page 2

assistance and consideration for approving the referenced well; and at sometime in the future I hope the work achieved in the past twelve months will assist others in successfully permitting and drilling on forest service lands.

Please call if you have any questions.

Sincerely,

DOLAR OIL PROPERTIES

Mark S. Dolar, CPL

MSD/df

cc: David Dix/Chorney
Kendal Kuiper/Global



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter

Governor

Dee C. Hansen

Executive Director

Dianne R. Nielson, Ph.D.

Division Director

355 West North Temple

3 Triad Center, Suite 350

Salt Lake City, Utah 84180-1203

801-538-5340

July 9, 1992

Global Natural Resources Corporation
of Nevada
5300 Memorial Drive, Suite 800
Houston, Texas 77007

Gentlemen:

Re: Timber Canyon 17-1, Sec. 17, T. 5S, R. 9W, Wasatch County, Utah,
API No. 43-051-30017

Per the request of your agent, Dolar Oil Properties, approval to drill the above referenced well is hereby rescinded. A new Application for Permit to Drill must be filed with this office for approval, prior to the commencement of any future work on the subject location.

If any previously unreported operations have been performed on this well location, it is imperative that you notify the Division of Oil, Gas and Mining immediately.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Don Staley'.

Don Staley
Administrative Manager
Oil and Gas

DME/lde

cc: Bureau of Land Management - Vernal
Dolar Oil Properties
R.J. Firth
Well file

WOI139



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Vernal District Office
170 South 500 East
Vernal, Utah 84078

Phone (801) 789-1362

FAX (801) 789-3634



IN REPLY REFER TO:

3162
UT08438

Global Natural Resources Corp. of Nev.
5300 Memorial Drive, Suite 800
Houston, TX 77007

Dolar Oil Properties
Attn: Mark S. Dolar
9035 South 700 East, Suite 100A
Sandy, UT 84070-2418

JUL 9 1992

RECEIVED

JUL 10 1992

**DIVISION OF
OIL GAS & MINING**

Re: Rescind Application for Permit
to Drill **43-051-30017**
Well No. Timber Canyon 17-1
Section 17, T5S, R9W
Lease No. U-48776
Wasatch County, Utah

Gentlemen:

The Application for Permit to Drill the above-referenced well was approved on March 24, 1992. As per request from Mark S. Dolar of Dolar Oil Properties, this office is rescinding the approval of the referenced application without prejudice. If you intend to drill at this location at a future date, a new Application for Permit to Drill must be submitted.

This office requires a letter confirming that no surface disturbance has been made for this drill site. Any surface disturbance associated with the approved location of this well is to be rehabilitated. A schedule for this rehabilitation must be submitted to this office. Your cooperation in this matter is appreciated.

Sincerely,

Howard B. Cleavinger II
Assistant District Manager for Minerals

cc: State Div. OG&M
Ashley National Forest-Duchesne